# Health Care Financing Grants and Contracts Report

## Large Medicaid Practices: Are They Medicaid Mills?

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## Large Medicaid Practices: Are They Medicaid Mills?

This report was made pursuant to contract #500-78-0051 between the Health Care Financing Administration, and Boston University and Health Economics Research, Inc.

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# ABSTRACT

Physician nonparticipation in Medicaid programs not only will restrict access of the poor to mainstream medicine, but it also will encourage the development of large Medicaid practices (LMPs). Policymakers have become increasingly concerned that these settings may be "Medicaid mills" in which low quality care is provided. This study sought to describe the characteristics of these physicians who treat a disproportionate number of Medicaid patients, and to determine whether they are in fact operating mills. While practices with a majority of Medicaid patients are a distinct minority of all practices (5.5%), nearly 32 percent of all Medicaid patients receive care in these extra-large practices. Furthermore, nearly 60 percent of all Medicaid patients are treated in practices at least 30 percent Medicaid (15.5 percent of all practices).

There is no evidence that LMPs can be characterized as Medicaid mills. Visit lengths are shorter in LMPs, but only a minute or two. Nor is there any widespread abuse of ancillary services, skimping on auxillary staff, or excessive markups over costs. LMP physicians at best earn what other physicians make; usually earnings are less. Contrary to the stereotype, most LMPs are not found in large, inner city ghettos, but rather in small cities, in rural areas, and in the South. Competition, however, does seem to have driven less qualified physicians into the Medicaid market in disproportionate numbers. LMP physicians tend to be older, to be trained in foreign medical schools, and to have fewer credentials, such as board-certification.

Policy decisions governing key elements of the Medicaid program may have unintended side effects on the quantity and quality of services provided to Medicaid patients. Extensive coverage of the poor under Medicaid definitely encourages the development of LMPs. Higher fee schedules, on the other hand, will foster LMPs, but also encourage nonparticipants to enter the Medicaid market; no adverse effects on the size distribution of Medicaid practices result. Fraud and abuse legislation may deter illegal behavior, but blanket public indictment of LMPs may discourage altruistic physicians from expanding their practices in an underserved area.

# ACKNOWLEDGMENTS

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J. M.

J. C.

# I STATEMENT OF THE PROBLEM

> If you are a Medicaid patient, you can expect to be treated in a clinic located in a dilapidated part of the city.
>
> The outside of these clinics, or Medicaid mills, are (sic) garish. . . They may be brightly painted, with awnings, banners, and pennants. . . The front window lists an impressive array of services -- everything from a psychiatrist to a podiatrist.
>
> Inside, the mill will be cramped and sparsely furnished. It will be dirty. Cleanliness is not prized in Medicaid mills; it costs too much money. The floors look like they haven't been swept in a month and the rest rooms are abominable.
>
> As you enter a mill you will be greeted by a receptionist or someone who looks like a nurse. . . You may be asked whom you want to see or what is your medical problem. Or you may not.
>
> Now you wait for an hour, sometimes two. . .
>
> When you do get to see a practitioner, your visit will be brief -- usually from three to five minutes. . .
>
> You will be given a general examination no matter how specific your complaint. If blood pressure is taken or a stethoscope is used, the odds are it will be done through your clothing. . . Medicaid doctors do not like toughing their patients.
>
> At some point, the doctor will take blood [which] confirms that treatment has been rendered. . . But, perhaps just as important, samples presented to clinical laboratories will generate a return of $15 each from the laboratory.
>
> In addition, you are going to be asked for a urine sample; you will be given a number of x-rays and perhaps a shot or two. . .
>
> If you are not sick, you won't be told you're not sick. If you are sick, the odds are you won't be helped.
>
> ---Senator Frank Moss (1979, pp. 390-1)

Senator Moss' vivid description of the notorious "Medicaid mill" arouses both anger and disappointment. We are mad that government and state medical societies allow such abuses to occur, disappointed that the Medicaid poor have not been integrated into mainstream American medicine. How does this happen? What can be done about it?

No one can profess to know the best course of action. The 1977 Medicare-Medicaid fraud and abuse amendments (H.R.3) which increase penalties for fraud, suspend convicted practitioners, and require full disclosure of ownership and financial relationships with laboratories should help, but the physician sector is very difficult to regulate. There are over 300,000 practicing physicians in the United States, most in solo or small group practice. It is very difficult to ascertain appropriateness of care because each patient is different and few rigid protocols of diagnosis and treatment exist. Finally, patients, out of ignorance, must delegate fundamental medical decisions to their physicians, giving them considerable discretion over the quality of care they will deliver. Medicaid patients may be more vulnerable to exploitation in physicians' practices than are other insured patients. Because they are not actually paying for care, Medicaid patients may be reluctant to complain, or to demand longer visits with the physician, for example. Due to a relative lack of education, cultural differences, and/or language barriers, furthermore, Medicaid patients may be even less able to evaluate the quality of services received.

What can be done, then, besides outlawing certain types of financial behavior (e.g., kickbacks from laboratories, fradulent bills)? What about the visits that are too brief, the unsanitary conditions, the unnecessary "ping-pong" referrals within a group? Before attempting an answer, we might ask how big a problem do we have? A few extraordinary incidents would suggest a very direct approach: identify individual abuses through various means (e.g., random sampling of claims, unannounced visits to garish store-front practices) and then prosecute the offenders. If, however, the problem is more widespread, then a less direct approach may be required, one which reduces the motives or opportunity for wrongdoing.

The sine qua non of a Medicaid mill is that the majority of patients treated are covered by Medicaid, suggesting special investigation of all Large Medicaid Practices (LMPs). A high-volume Medicaid practice is by definition suspect in the eyes of some public officials (Bellin and Kavaler, 1971). While all Medicaid mills must be large Medicaid practices, not all LMPs are mills, however. Before branding all LMPs as disreputable, we would first like to know how many LMPs are, in fact, mills. The quality of care being delivered in LMPs is also of special policy interest. LMP physicians may not be running mills in any sense of the word, but if they are poorly trained, care may be less than that enjoyed by patients in the mainstream of American medicine (Frederick, 1975). A greater travesty than the patients processed through a small number of Medicaid mills may be the widespread, unconscious delegation of patients to a second-class market served by older, poorly trained, foreign medical graduates.

Examining LMPs as a group may provide some measure of the extent of the "mill problem" so resourcefully unearthed by Senator Moss; we may also shed light on the quality of ambulatory physician care being afforded the majority of Medicaid patients. How do LMPs come about, what motivates physicians to rely on Medicaid for a majority of their revenues? Do they do so voluntarily out of altruistic motives, or are their motives less pure? Might they possibly be accidental in the sense that population and physician migration, technical change, and training have relegated them to a Medicaid-oriented practice in order to make a decent living? Or might these physicians be serving a non-white community consciously ignored by other, affluent white physicians? If we knew more about why LMPs exist, we may be able to suggest ways to spread the Medicaid load more evenly, to take the burden off the overworked or to apply more competitive pressure to those abusing the program. Medicaid patients may frequent Medicaid mills in large part because no readily available alternatives exist (except, of course, the hospital emergency room). If nonparticipants could be encouraged to participate, or physicians seeing small numbers of Medicaid patients to increase their Medicaid caseloads a little, the need to resort to a storefront clinic would be attenuated and mills should subside.

Our study, with its reliance on survey data, can only begin to address the myriad of issues in this area. At bottom, two questions are explored: (1) In what sense can the care being delivered in large Medicaid practices be considered inferior, either consciously or because of circumstance; and (2) What are the factors that contribute to inequalities in Medicaid access to physicians' offices and promote the emergence of LMPs as the primary source of care in a community. Our exploration includes a comparison of LMPs with other practices along many dimensions: specialty, training, age, caseloads, lengths of visits, use of auxillary personnel and ancillaries, revenues, costs, markups, and net incomes. Special attention is paid to those exceptional LMP physicians who somehow manage to earn over $80,000 per year in spite of low Medicaid fees covering a majority of their patients. Finally, a theory of Medicaid participation is extended to LMPs and tested empirically using multivariate techniques. The results provide interesting insights into the origins and nature of the size distribution of Medicaid practices.

## II. LITERATURE REVIEW

Much of the evidence to support descriptions of large Medicaid practices as mills can be found in the lay press. Often, these are sensationalized accounts of an individual physician or practice earning excessively high incomes from seeing an inprobable number of Medicaid patients. Another source of information has been the HEW-published list of physicians whose gross annual revenues from Medicaid (or Medicare) exceed $100,000. These data must be interpreted with caution, however. High Medicaid payments alone may be deceiving, especially if these payments are not disaggregated by practice size. Total Medicaid revenues, furthermore, may represent varying proportions of total gross income which, in turn, may influence physician behavior. The physician with 20 percent of his practice devoted to Medicaid patients may spend his time very differently from another treating only Medicaid patients. Finally, such data reveal nothing about the type, intensity, or quality of services in these practices.

The few studies conducted to date yield only suggestive evidence of inadequate care in large Medicaid practices. The absence of a control group and the non-random selection of physicians make it impossible to generalize from these studies. Nevertheless, they do provide some descriptive information on the prevalence and characteristics of large Medicaid practices.

Perhaps the best known and most original of these studies is that conducted by Senator Frank Moss in his role as chairman of the Senate Subcommittee on Long-Term Care (Moss, 1979). This study was specifically aimed at determining Medicaid fraud and abuse in shared health facilities (SHFs), defined by New York City Health Department regulations as practices with three or more providers (not necessarily physicians) who share at least some costs and who have received (in aggregate) at least $5,000 from the Medicaid program in any one month (Nathan, 1979). These facilities are generally located in the inner city and provide ambulatory care on a walk-in basis.

Senator Moss and his staff employed two innovative techniques to identify practices in Chicago and New York City. First, staff posed as physicians and opened a storefront practice in Chicago. Immediately, they were besieged by representatives from different clinical laboratories, who offered large kickbacks in return for all laboratory business. Using Medicaid claims data, staff members identified physicians who used these particular laboratories and interviewed 50 of them. Many of these physicians were foreign medical graduates who confirmed that they received kickbacks from the laboratories in question, as well as from other providers. Approximately one-half of the FMGs were actually employees, who worked in return for a fixed percentage of the Medicaid revenues they generated. Total billings, as well as the kickbacks themselves, went directly to the businessman who owned the facilities.

Second, Senator Moss and his staff paid incognito visits to suspect SHFs in Chicago and New York City ghetto neighborhoods, where they posed as Medicaid patients with fictitious complaints. Based at least on their reported experiences, these facilities qualify as Medicaid mills. A simple complaint of a cold might result in extensive laboratory tests, electrocardiograms, x-rays, and multiple prescriptions to be filled "at the pharmacy next door". "Ping-pongs", the practice of making numerous referrals to other providers in the same facility, clearly helped maximize total Medicaid revenues per patient. Actual visits spent with the physician were characterized as extremely short, e.g., three minutes. The SHFs visited by Senator Moss were also described as having dirty facilities and long waits.

The Moss committee report provides a colorful, and distressing, portrait of Medicaid mills. While fraudulent behavior and low quality care certainly were characteristic of these facilities, findings are limited to the handful of practices actually visited. In particular, we have no way of determining whether such behavior is characteristic of large Medicaid practices (LMPs) generally. A high percent distribution of Medicaid patients cannot be considered prima facie evidence of a mill, a point we return to in detail later in this report. Besides, there is evidence that some SHFs do provide better care than that reported by Moss et al., at least from the point of view of the patients. Interviews were conducted with 228 patients waiting for care at three SHFs and three hospital outpatient departments all located in ghetto areas of New York City (Nathan, 1979). These facilities were reportedly the only sources of ambulatory care in their respective communities. SHF patients expressed greater satisfaction with the quality of medical care received than did the group using hospital OPDs. Reasons cited for their choice of facility by SHF respondents included convenience, short waits, and courtesy and warmth on the part of physicians. Conversely, crowded conditions, long waits, and a contemptuous demeanor of hospital physicians were the most frequently reported reasons for dissatisfaction with hospital outpatient care. While this study is subject to methodological problems, including its small sample size, it does suggest that at least some of the so-called Medicaid mills play an important role in their communities. In particular, these SHFs provide ready access to ambulatory medical care, and their staff share a common social and cultural background with the patients they serve. Some hospital outpatient departments, on the other hand, may be running their own version of a Medicaid mill.

Additional evidence of Medicaid abuse by providers was provided by the Senate Finance Committee in 1970. Physicians receiving $25,000 or more from either Medicare or Medicaid were identified for closer scrutiny. The committee concluded that a minority of these physicians were abusing the two federal programs; abuses included exorbitant numbers of laboratory tests and injections, and gang visits to nursing homes.*

The limited evidence available suggests that large Medicaid practices represent a small proportion of all physician practices. A study of all Maryland physicians who participated in their state's Medicaid program found that only two percent had seen more than 1,000 Medicaid patients over a twelve-month period (Studnicki et al., 1978). Given a mean annual caseload of 6,065 visits (AMA, 1979), even 1,000 Medicaid patients is not an unreasonable number. A 1974 survey of California Medical Association members reported a higher proportion of large Medicaid practices (Jones and Hamburger, 1976); 14.9 percent of respondents stated that Medicaid patients constituted over one-fourth of their practice. This estimate may be subject to sampling error and/or nonresponse bias. Only 6.3 percent of respondents reported that they did not treat Medicaid patients, as contrasted with national estimates of Medicaid nonparticipation of 29.2 percent (Sloan, Mitchell, and Cromwell, 1978).

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*The use of ancillary services, particularly laboratory tests, may lead to higher physician revenues in two ways. First, the physician can direct all of his laboratory business to a particular facility in return for a kickback, clearly an illegal activity. Second, the physician may perform his own laboratory work, for which he then bills Medicaid and retains any profit. Internalization of such ancillary services is certainly a legitimate enterprise; it becomes fraudulent only when the physician orders unnecessary tests in order to maximize profits.

National survey data for primary care physicians estimate the prevalence of large Medicaid practices at ten percent, as defined by a practice with at least 30 percent of total visits rendered to Medicaid patients (Sloan, Cromwell, and Mitchell, 1978). Despite this relatively small proportion of large Medicaid practices, however, poor quality of care in such practices may harm a large (albeit unknown) number of Medicaid patients. Second-class care in large Medicaid practices is alleged to be a function of such physician characteristics as old age, lack of credentials, and a high caseload. Another alleged characteristic of large Medicaid practices is their excessive use of ancillary services, such as laboratory tests and x-rays. This not only drives up Medicaid expenditures, but, to the extent such services are unnecessary, is also poor quality care. The two Senate committee reports cited earlier, provide some evidence of such excessive ancillary use. Other studies of large Medicaid practices have primarily focused on physician characteristics. These findings and their implications for quality of care are discussed below.

To the extent that older physicians are less skilled technically, and/or have not kept pace with medical progress, they may provide poorer care. A study of 126 Medicaid participants in the Black and Puerto Rican sections of New York City found that over one-half of all the practices had been established for at least twenty years (a proxy for physician age); only five percent of the practices had been started in the past five years (Kavaler, 1969). General practitioners have also been found to run large Medicaid practices in disproportionate numbers (Jones and Hamburger, 1976), raising the concern that the poor may not have equal access to specialized care. After adjusting for age, general practitioners were still found to have larger Medicaid practices than were primary care specialists (Sloan, Mitchell, and Cromwell, 1978). Holding specialty constant, however, as well as other variables such as physician health status and political attitudes, older physicians had significantly lower levels of Medicaid participation.

A disproportionate number of large Medicaid practices are believed to be run by Foreign Medical Graduates (FMGs). To the extent that FMGs may have less training or inadequate training, Medicaid recipients in these practices are receiving low quality care.* Data from the 1975 HCFA physician survey showed that FMGs from Third-World countries had significantly larger Medicaid practices (Sloan, Mitchell, and Cromwell, 1978).* (Third-World FMGs were defined as graduates of medical schools in non-English-speaking, non-Western European countries.) The Third-World FMG on average spent about 15 percent of his practice with Medicaid patients, compared with 10 percent for domestic and European-English speaking country graduates. A state-wide study also found that FMGs were more likely to participate in Medicaid; in 1974, FMGs constituted 22 percent of all licensed physicians in Maryland, but they represented 36 percent of all Medicaid participants (Studnicki _et_ _al_., 1976). The Medicaid market share of FMGs in Maryland appeared to actually be increasing. _New_ entrants to the Medicaid market (i.e., Medicaid participants who had been licensed to practice within the previous two years), were almost exclusively FMGs (94%). If such a trend exists, it should slow as the entry of FMGs is restricted under the Health Professions Education Act of 1976. This raises serious questions about the future access of the poor (at least in Maryland) to medical services. Is some care better than no care?

---

*Indirect measures of physician performance, such as scores on state license examinations and the ECFMG examination, indicate that FMGs are far less competent than U.S. medical graduates (Lowin, 1975; Weiss et al., 1974). Tan (1977) has argued that methodological flaws make some of these studies suspect; in addition, a failure to achieve high scores on written exams does not necessarily imply medical incompetence. Nevertheless, the concentration of FMGs in settings serving low-income popultations, such as public hospitals (Lowin, 1975), strongly suggests a two-class system of medical care.

Two other attributes generally associated with high quality, board-certification and medical school appointments, have shown a negative relationship with Medicaid participation levels (Sloan, Mitchell, and Cromwell, 1978). Holding specialty constant, however, these variables were not significant.

A disproportionate number of physicians with high-volume Medicaid practices are alleged to have no hospital affiliations, thus limiting their ability to care for their patients. The physician with no hospital affiliations is clearly constrained in his ability to provide comprehensive treatment; because he is unable to admit patients, he also cannot perform surgery, and he cannot even visit a patient in the hospital. As the decision to grant a physician admitting privileges is made by his peers, non-affiliation is sometimes viewed as _prima_ _facie_ evidence of relative incompetence. A study of 126 Medicaid participants in New York City's ghettos (all general practitioners) found that 35 percent had no access to hospital beds and 42 percent had only limited privileges at proprietary hospitals (Kavaler, 1969). Similarly, a Chicago study reported that only 40 percent of Medicaid participating physicians had hospital appointments, as compared with 80 percent of all physicians city-wide (Bloom _et_ _al_., 1968). Since the authors did not control for specialty, however, this comparison may not have been appropriate.**

---

*In light of recent legislation to curtail the immigration of foreign medical school graduates, the estimated marginal effect for this FMG variable in the participation equations is particularly significant, both statistically and in its implications for access to care.

**Data from the 1976 NORC survey show that the prevalence of hospital affiliations varies considerably by specialty, from 79 percent for dermatologists to 100 percent for neurosurgeons. The vast majority of general practitioners (95.1%) in the survey reported that they were affiliated with a hospital.

LMP physician caseloads have been alleged to be excessively high, seriously limiting the amount of time the physician spends with any one patient, hence the term "Medicaid mills". The Chicago study cited earlier reports "documented instances" of physicians seeing 150 Medicaid patients a day. While such a caseload is clearly excessive by any standard, it may not be representative of large Medicaid practices generally. In particular, it is necessary to compare the number of patient visits in large Medicaid practices with those in other practices while holding total hours worked constant. In areas of lower physician density, such as the South and rural communities, physicians have consistently worked longer and harder. If large Medicaid practices are disproportionately located in communities with low physician-population ratios, then their high caseloads may not be inappropriate.

These descriptive studies, and particularly the Moss committee investigation, suggest that large Medicaid practices are run by poorly trained but wealthy, physicians who spend inadequate time with patients and overprescribe tests and procedures. Based on these studies, we can not determine whether such behavior is characteristic of all large Medicaid practices, or whether it is limited to only a few true "Medicaid mills". Only one study (Sloan, Mitchell, Cromwell, 1978) used a national sample, but it did not examine the question of large Medicaid practices directly. The remaining studies were based on a few, selected practices, usually in the same two cities (Chicago and New York). Perhaps most important these studies generally had no other physician practices for comparison purposed. It is thus almost impossible to determine how many laboratory tests and injections are too many, whether office visits are too short, or whether practice loads are excessively high. The survey data presented in this report will enable us to compare the behavior in large Medicaid practices with that of other physician practices on a national basis for the first time.

# III. AN ECONOMIC THEORY OF LARGE MEDICAID PRACTICES

The origins of large Medicaid practices can be considered in terms of a two-market demand model.* In one market, the physician is a price-setter: demand is downward sloping and additional visits are demanded only at lower prices. In the second market, fees are predetermined and the physician serving this market can provide as much as he chooses, within limits, at a fixed price. While several insurers have fixed payment schedules, we consider only the fixed payment Medicaid program here.

Assuming revenue maximization for each visit level, the physician moves down along his private demand curve, AB, in Figure III-1 until marginal revenue falls below the fixed Medicaid fee, $f_m$.** The physician would then begin to participate in the Medicaid program until the pool of Medicaid patients were exhausted.*** Demand segment, BC, corresponds to the potential pool of Medicaid patients upon which each physician may draw. In the absence of a Medicaid program, physician demand would be ABE. The introduction of Medicaid effectively segments ABE into two parts, one above, one below, the Medicaid fee, $f_m$. Patients in the upper segment, AB, are willing and able to pay higher fees than $f_m$ while in segment CD (or BE) they will only pay less than $f_m$. If a physician's supply curve were SS, he would be willing to supply $V_2$ total visits in the absence of the Medicaid program versus $V_3$ visits with Medicaid, assuming a positively sloped supply curve.**** Under Medicaid, this physician could be said to be operating a Small Medicaid Practice (SMP) as the majority of his visits, $V_1$, are with private patients, the difference, $V_3 - V_1$, being devoted to Medicaid patients, for an overall Medicaid participation rate of $(V_3 - V_1)/V_3$ percent. If physician supply were further to the right, say S'S', then $V_4$

---

*A more complete exposition of the two-market demand model, including a comparative statics analysis of changes in exogenous demand and supply variables, can be found in Sloan, Mitchell, Cromwell (1978).

**For a monopolist facing a downward sloping demand curve, marginal revenue would be below the demand curve. If the physician were a perfect price discriminator, however, marginal revenue and demand curves would coincide. The relevant marginal revenue curve, therefore, will be closer to the demand curve the more the physician price discriminates.

***While the total Medicaid pool would more than fill the caseload of any individual physician, limited access implies a finite potential pool that a physician could realistically serve. This may or may not exhaust the rest of his patient contact hours.

****Physician supply could be backward sloping if the income effect (preference for leisure) dominated the substitution effect (of work for leisure) resulting from higher fees. Many of the conclusions of this section would be reversed in this case (e.g., the impact of higher Medicaid fees on the number of Medicaid visits).

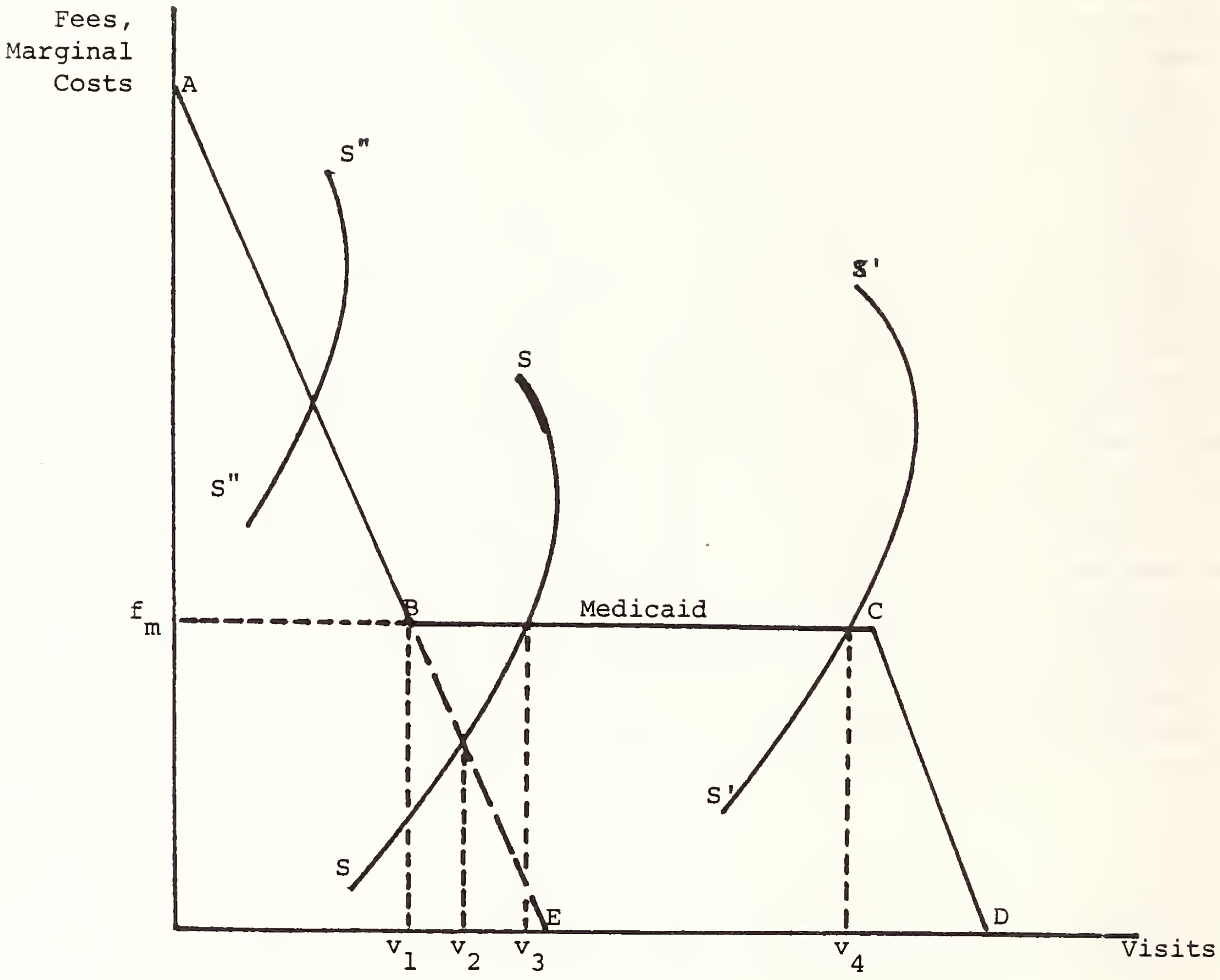

Figure III-1: A GRAPHICAL MODEL OF MEDICAID PARTICIPATION

visits would be supplied, $(V_4 - V_1)$ of them Medicaid, for a participation rate, $(V_4 - V_1)/V_4$. This practice could be called a Large Medicaid Practice (LMP), as a majority of patient visits are devoted to Medicaid patients.* If supply were far enough to the left of SS, say S"S", then the physician would not be accepting any Medicaid patients.

Thus, the physician's decision to participate in Medicaid as well as the level of his participation will depend on supply and demand. Physician supply is derived from the physician's own cost function (including an imputed wage to physician time) assuming profit-maximizing behavior.** The position of the curve depends on exogenous factors like input prices while the slope would depend on marginal costs (or marginal productivity) and the physician's marginal utility of income (or leisure). That the SMP supply curve is to the left of LMP supply implies that the SMP physician is financially incapable of, or personally unwilling to, supply as many visits _in toto_ as the LMP physician. If all physicians faced identical private demand curves and the same Medicaid fees, then it follows that LMP physicians must be seeing more patients than SMPs: both would be seeing the _same_ number of private patients before entering the Medicaid market and the LMP physician by definition would be seeing more Medicaid patients. Our empirical work does show about 10 percent more visits for LMPs which is consistent with the theory, but it would not have to be the case depending on demand.

Private physician demand will depend on several key factors, the most important of which are (a) health status, (b) income, (c) insurance, (d) physician credentials, and (e) physician competition. Public, or Medicaid, demand (ignoring the other public programs like Medicare) will depend on (a) the size of the program (i.e., eligibility criteria, scope of benefits), (b) the generosity of the program (fee levels), and (c) physician competition. Considerable empirical research (e.g., Feldstein, 1971; Newhouse and Phelps, 1976) has documented the positive effects of health status, income and insurance on private demand. Patients should also be willing to pay higher fees to see better trained specialists. Holding these factors constant, private demand should be lower in physician-rich areas because of competition, as limited numbers of patients are spread among a large number of physicians.*** Medicaid demand will vary positively with the pool of Medicaid eligibles, the scope of benefits, and allowable fees, and negatively with physician supply (i.e., for a fixed Medicaid pool, the available number to draw upon will be less when many other physicians are also seeing Medicaad patients).

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*In the empirical work, two arbitrary definitions of LMP are used based on the participation rate, namely 30 and 50 percent. The mean participation rate of participating physicians is tightly distributed around a mean of 17 percent.

**This assumption is made for analytical convenience. See Sloan, Cromwell, Mitchell (1977) for consideration of other objectives. Nonmaximizing behaviors, e.g., discrimination, are considered later.

***This assumes no demand inducement. If physicians can protect themselves against competition by arbitrarily shifting private demand, then more physicians in an area would not necessarily lead to fewer private visits per physician and the corollary, more Medicaid visits. Perceived disadvantages to serving Medicaid patients (e.g., payment delays, discrimination), may actually encourage some physicians to induce private demand rather than enter the public market.

Because of variations in private and public demand, either geographically or by physician (say, due to credentials), LMPs would not necessarily be supplying more total visits. Consider in Figure III-2 two practices each with the same supply curve, SS, but facing different private demand curves, $D_1D_1$ and $D_2D_2$ (assume Medicaid demand the same for now). These practices and their corresponding demands can be thought to originate in different communities, or if in the same community, with different credentials. In either case, both practices would be providing $V_3$ visits in total, but the practice with demand, $D_1D_1$, would be an LMP with Medicaid participation rate, $(V_3 - V_1)/V_3$, while the second practice with greater demand, $D_2D_2$, would be an SMP with a much lower participation rate, $(V_3 - V_2)/V_3$.

It is also entirely possible that two physicians with identical supply curves, S'S', but different demands, $D_1D_1$ and $D_2D_2$, would see different numbers of patients. The physician in a high demand area would be a nonparticipant although his total visits, $V_5$, is greater than those supplied by the physician in the low demand area $(V_4)$. The latter, in fact, would usually be considered operating an LMP as his participation rate, $(V_4 - V_1)/V_4$, is approximately fifty percent. Thus, LMPs can have lower caseloads than other practices if private demand is exceptionally meager.

## Medicaid Administration

Medicaid participation and the existence of LMPs can also be explained by variations in the Medicaid program itself. States use a variety of different methods to set physician reimbursement rates under Medicaid; the only federal requirement is that Medicaid payment levels not exceed corresponding rates for Medicare. Thirteen states (plus D.C.) employ the same methods of reimbursement as the Medicare program, a variation of the usual, customary, and reasonable (UCR) charge criteria originally developed by Blue Shield (see Table III-1). Almost one-half of the states (23) use some combination of UCR methods to set allowable fees while the remaining states use traditional fixed fee schedules. This latter group includes the two largest Medicaid programs in the country, California and New York. UCR criteria are more flexible than fixed fee schedules since they incorporate both historical and geographic variations in physicians' charges. Medicaid programs using UCR methods thus will be relatively more generous in their payment levels, and we would expect higher physician participation levels in these states.

All states must provide Medicaid coverage to all cash recipients of two welfare programs: Aid to Families with Dependent Children (AFDC) and Supplemental Security Income (SSI). Although SSI is a federal program, states historically using more restrictive eligibility criteria were permitted to continue doing so; in fourteen states, Medicaid is extended to a narrower range of aged, blind, and disabled individuals. States also have the option of extending Medicaid coverage to additional groups such as the "medically needy', whose incomes make them ineligible for one of the categorical assistance programs. Twenty states have elected not to provide this optional Medicaid coverage. With a few exceptions, these

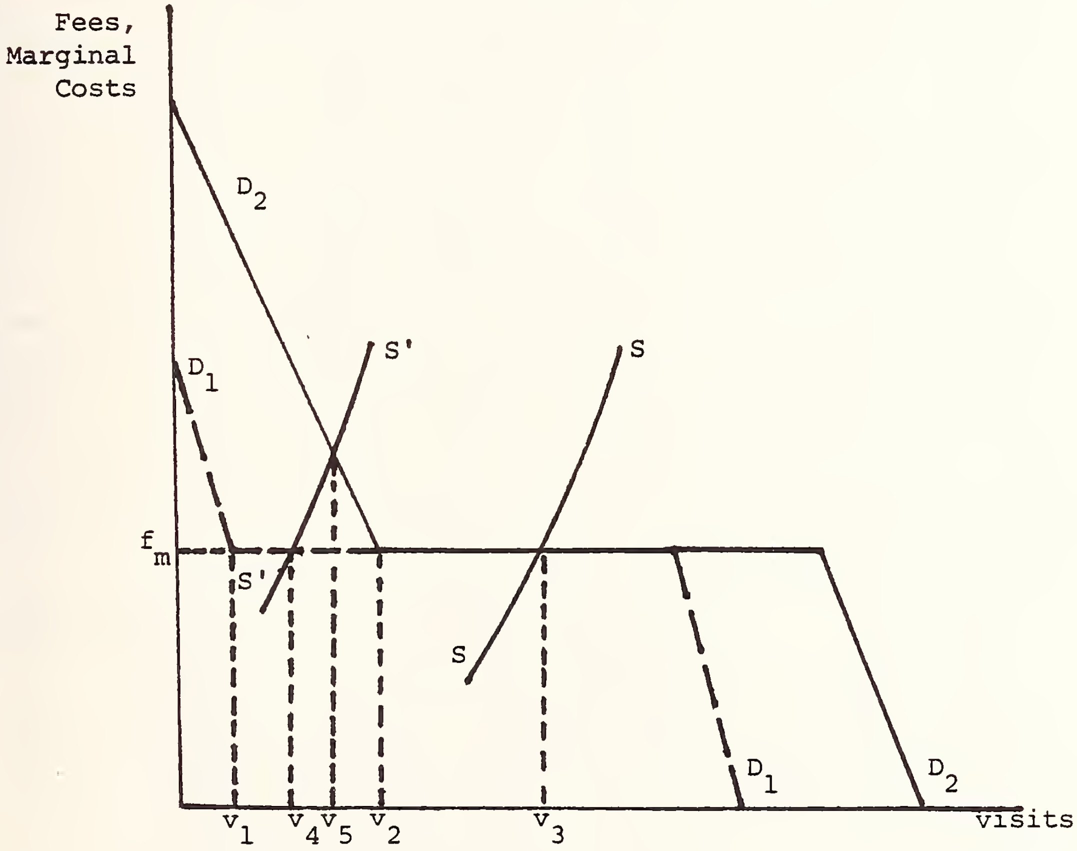

Figure III-2: DEMAND EFFECTS ON MEDICAID PARTICIPATION AND LMPs

TABLE III-1

## VARIATIONS IN REIMBURSEMENT AND ELIGIBILITY ACROSS STATE MEDICAID PROGRAMS

| | | Eligibility | | | | Quantity | | |
|---|---|---|---|---|---|---|---|---|
| State | Reimb. Methods (1) | (2) SSI | (3) Med. Needy | (4) Other | (5) % of Poor | (6) Visit Restrict. | (7) Prior Auth. | (8) Other |
| North East | | | | | | | | |
| Connecticut | UCR | S | Y | UF;C | 75 | Y | Q | N |
| Delaware | UCR | F | N | UF | 61 | N | N | N |
| D.C. | M | F | Y | UF;C | 91 | Y | S | P |
| Maine | M | F | Y | C | 44 | N | N | N |
| Maryland | FF | F | Y | UF;C | 76 | N | S | N |
| Massachusetts | FF | F | Y | UF;C | n.a. | N | A | N |
| New Hampshire | FF | S | Y | N | 45 | Y | N | N |
| New Jersey | UCR | F | N | UF;C | 55 | Y | Q;S | P |
| New York | FF | F | Y | UF;C | 156 | N | N | N |
| Pennsylvania | UCR | F | Y | UF;C | 93 | Y | S | N |
| Rhode Island | UCR | F | Y | UF | 96 | Y | Q | P |
| Vermont | M | F | Y | UF;C | 71 | Y | N | P |
| North Central | | | | | | | | |
| Illinois | UCR | S | Y | UF | 55 | N | N | N |
| Indiana | M | S | N | N | 24 | N | N | N |
| Iowa | M | F | N | UF | 36 | N | N | N |
| Kansas | UCR | F | Y | UF | 45 | Y | Q | TA |
| Michigan | FF | F | Y | UC;C | 54 | Y | N | N |
| Minnesota | UCR | S | Y | UF;C | 57 | N | N | N |
| Missouri | FF | S | N | UF | 38 | N | N | N |
| Nebraska | FF | S | Y | UF | 33 | N | N | N |
| No. Dakota | UCR | F | Y | N | 24 | N | N | N |
| Ohio | UCR | S | N | UF | 36 | Y | N | N |
| Oklahoma | M | S | Y | C | 46 | Y | N | N |
| So. Dakota | M | F | N | N | 17 | N | N | N |
| Wisconsin | UCR | F | Y | UF;C | 59 | N | S | N |
| South | | | | | | | | |
| Alabama | M | F | N | N | 17 | Y | A | N |
| Arkansas | M | F | Y | C | 10 | Y | N | N |
| Florida | M | F | N | N | 27 | Y | N | N |
| Georgia | UCR | F | N | N | 35 | Y | N | P |
| Kentucky | UCR | F | Y | UF | 43 | Y | Q | N |
| Louisiana | M | F | Y | N | 23 | Y | Q | N |
| Mississippi | FF | S | N | N | 16 | Y | N | N |
| No. Carolina | UCR | S | Y | N | n.a. | Y | Q;S | P |
| So. Carolina | UCR | F | N | N | 16 | N | N | N |
| Tennessee | UCR | F | Y | N | 19 | N | S | N |
| Texas | UCR | F | N | N | 18 | N | N | N |
| Virginia | UCR | S | Y | N | 21 | Y | N | TA |
| W. Virginia | FF | F | Y | UF | 35 | N | N | N |

TABLE III-1 : CONTINUED

| | | Eligibility | | | | Quantity | | |
|---|---|---|---|---|---|---|---|---|
| State | Reimb. Method (1) | SSI (2) | Med. Needy (3) | Other (4) | % of Poor (5) | Visit Restrict. (6) | Prior Auth. (7) | Other (8) |
| West | | | | | | | | |
| Alaska | UCR | F | N | N | n.a. | N | S | N |
| Arizona[1] | --- | -- | -- | -- | --- | --- | --- | --- |
| California | FF | F | Y | UF;C | 174 | Y | Q;S | P |
| Colorado | FF | F | N | UF | 61 | N | N | N |
| Hawaii | UCR | S | Y | UF;C | 95 | Y | Q | N |
| Idaho | M | F | N | N | 27 | Y | N | TA |
| Montana | UCR | F | Y | UF | 28 | N | N | N |
| Nevada | FF | F | N | N | 44 | Y | N | N |
| New Mexico | M | F | N | N | 28 | Y | N | TA |
| Oregon | FF | F | N | UF | 38 | N | S | N |
| Utah | UCR | S | Y | UF;C | 46 | Y | Q | P |
| Washington | UCR | F | Y | UF;C | 84 | Y | N | N |
| Wyoming | M | F | N | N | 19 | Y | N | N |

[1] Arizona does not have a Medicaid program.

KEY: Col. 1 - M=Medicare Method; UCR=Other UCR; FF=Fixed Fee
Col. 2 - F=Federal Standards; S=State (more restricted) standard
Col. 3 - Y=Yes; N=No
Col. 4 - UF=Unemployed father and families (includes UC); UC=Children of unemployed fathers only; C=All needy children; N=None of these
Col. 5 - n.a.=Not available
Col. 6 - Y=Visits restricted; N=Visits not restricted
Col. 7 - A=Prior authorization for all MD services; Q=Prior authorization to exceed quantity limitations; S=Prior authorization for special procedures; N=None of these
Col. 8 - TA=Abortions restricted; P=Special limits on psychiatrists; N=None

Source: Medicaid/Medicare Management Institute, 1979.

tend to be the less densely-populated and less industrial states. State programs also may expand coverage to two other financially eligible groups: all children under 21 years, and unemployed fathers and their families. These options will expand the pool of Medicaid patients particularly for pediatricians and general practitioners. Only eighteen states (plus D.C.) extend Medicaid coverage to all children; 26 states (plus D.C.) cover unemployed fathers and their families, and one state covers only the children in such families. States without such programs are disproportionately located in the South and North Central census regions.

The size of the Medicaid pool will depend not only on whether a state has exercised any of these options, but also on how income standards are set. Individual states have complete authority in setting such standards for eligibility purposes; the Medicaid pool will be reduced to the extent that these standards are set below poverty levels. As a result, the proportion of low-income persons eligible for Medicaid varies considerably across states, from 10 percent in Arkansas to 174 percent in California.* In ten states, Medicaid recipients account for less than 25 percent of the state's poor; these states are almost all located in the South. At the other extreme, Medicaid recipients constitute over 75 percent of the low-income population in nine states, almost all in the North East.

Although state Medicaid programs are required to provide physician services, they may impose limitations on the quantity of services, thus restricting total expenditures. Over one-half of the programs (27 states and D.C.) have instituted restrictions on the number of physician visits.** Physician supply may be limited across the board, or it may be limited differentially based on the site of care, i.e., hospital, nursing home, office, etc. Restrictions on ambulatory care typically range from one to three office visits per patient per month.

State Medicaid programs may also require that physicians receive prior authorization before supplying certain services to patients. Two states require such prior approval for any type of physician service; ten states require prior authorization in order to exceed quantity restrictions; and nine states (plus D.C.) need such approval for selected procedures such as cosmetic and transplant surgery. Prior authorization requirements may deter many physicians from supplying otherwise covered services; the administrative and psychic costs incurred in obtaining such approval from state Medicaid offices may simply be too great.

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*A national definition of poverty is used; area cost-of-living differences artificially widen this range.

**Some state Medicaid programs without visit limitations may insist that the service be medically necessary, but we do not consider this a true restriction on quantity. Some programs (both with and without visit limitations) may require prior authorization for some services, a point we discuss later.

These quantity restrictions may affect two specialties disproportionately more than others: obstetricians and psychiatrists.* Four states restrict reimbursement of abortions to only unusual circumstances, such as when the mother's life is endangered. Seven state programs impose limitations specifically on psychiatrists' services either by restricting quantity (one or two visits per year) or by limiting total Medicaid expenditures (e.g., $300.00 per year). The District of Columbia's Medicaid program, furthermore, will reimburse outpatient mental health services only within a clinic setting; office-based psychiatrists must obtain prior authorization to treat Medicaid patients.

Medicaid coverage and generosity of payment will definitely affect the level and nature of physician participation. Consider first an increase in Medicaid fees from $f_m$ to $f'_m$ without a change in program eligibility (see Figure III-3a). If physician supply were SS, only $V_1$ visits would be supplied, all to the private market, if $f_m$ prevailed. An increase in fees to $f'_m$ would increase the quantity supplied to $V_2$ with $(V_2 - V_3)$ visits being supplied to Medicaid patients. As drawn, the physician would probably be an SMP. Note that while total visits have increased with higher Medicaid fees, private visits have decreased, implying some substitution of poorer Medicaid for wealthier (or previously better insured) patients at the margin. If supply were S'S', the effect of a Medicaid fee increase would be to turn an SMP participation rate, $(V_5 - V_4)/V_5$into an LMP with participation rate, $(V_6 - V_3)/V_6$.

An increase in program eligibility or scope of benefits would have different effects as shown in Figure III-3b. Increasing the Medicaid-eligible pool has the effect of "lengthening" the Medicaid line from AB to AC. This should have no effect on non-participating physicians (supply SS): Medicaid fees have not increased so marginal revenues from private patients ($f_p$) still exceed the Medicaid fee.** Nor would it have any effect on participating practices that have not exhausted their potential pool of eligibles (S'S'), again for the same reasons. Some practices, however, may be seeing all the Medicaid patients who apply and some non-Medicaid poor in addition (S"S"). An extension of Medicaid coverage would have a positive effect on participation as well as on total visits as they substitute better paying Medicaid for poorer paying private patients. Participation would increase from $(V_2 - V_1)/ V_3$ to $(V_4 - V_1)/V_4$. A practice characterized by S"S" highlights an interesting point; that is, a practice may be seeing all the Medicaid patients that apply, but because the eligible population is so limited (at least before the program expanded), it is still an SMP.

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*Certain surgical specialists (e.g., plastic surgeons) also are limited in the Medicaid services they can provide, but for policy purposes, we are less interested in them.

**According to the 1975 physician survey, 77 percent of nonparticipants did not feel the absence of Medicaid eligibles explained their nonparticipation. Other factors like low fee schedules were emphasized. See Sloan, Cromwell, Mitchell (1978, p. 122).

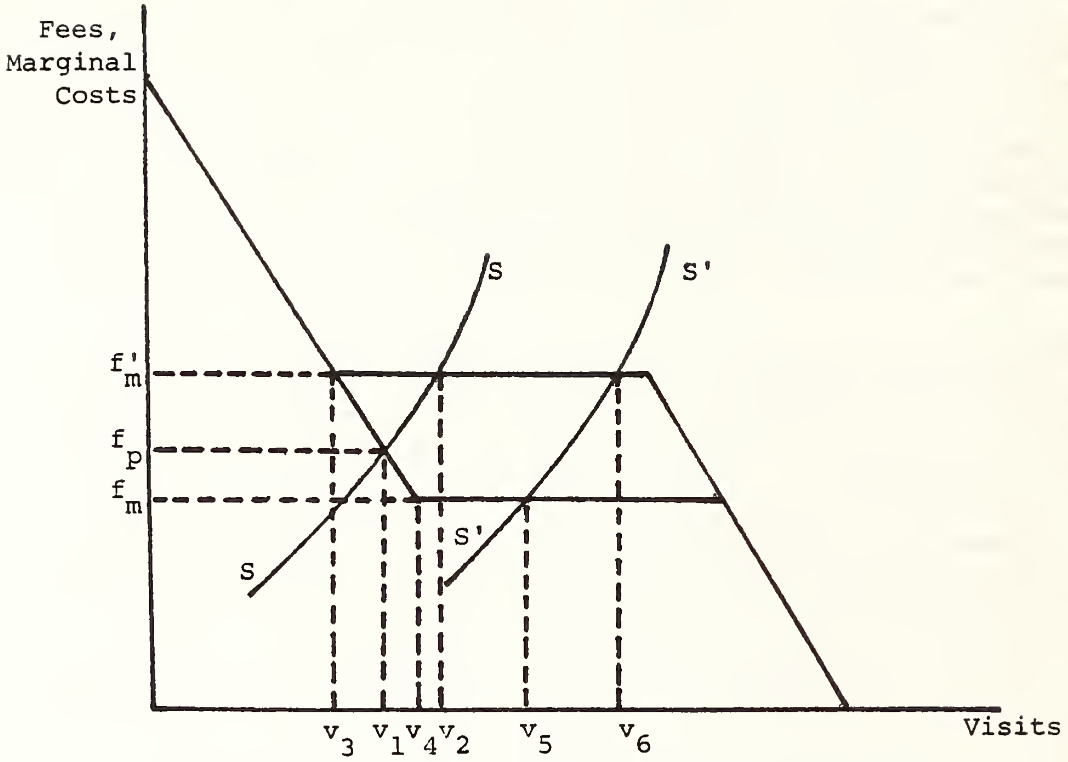

Figure III-3a: INCREASED MEDICAID FEES, MEDICAID PARTICIPATION, AND LMPs

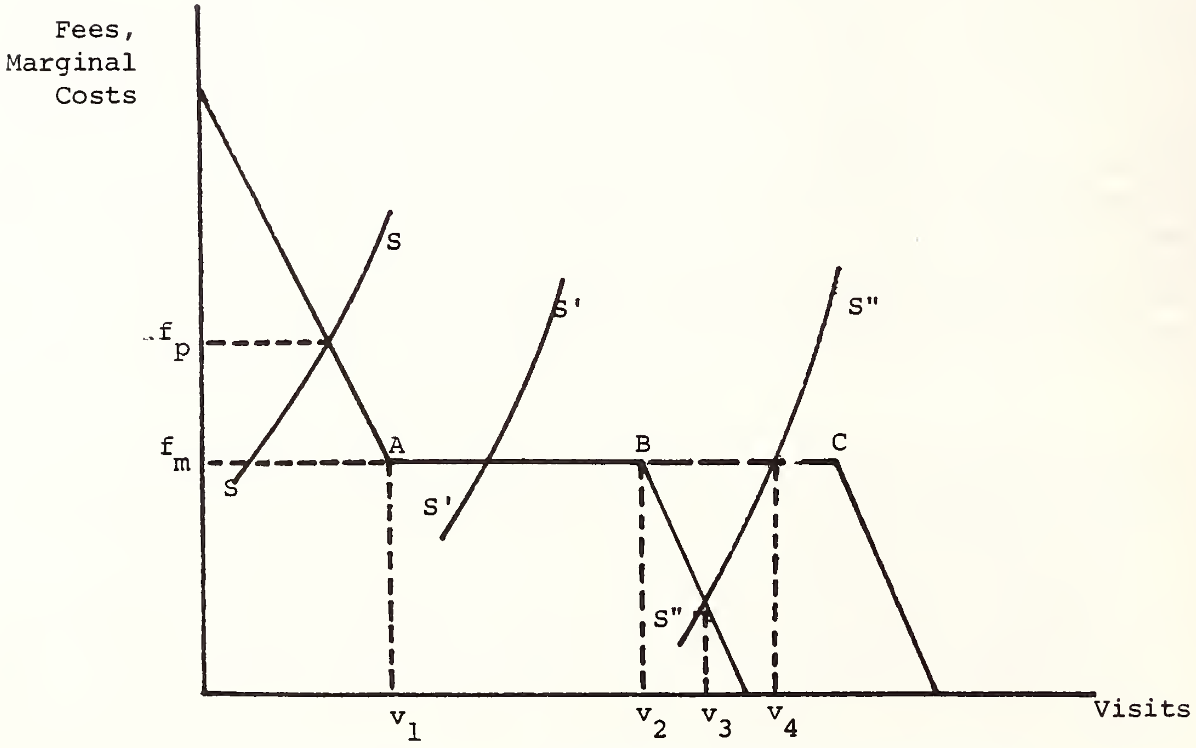

Figure III-3b: INCREASED MEDICAID ELIGIBILITY AND BENEFITS, MEDICAID PARTICIPATION, AND LMPs

Because income is still an important factor in the private demand for physicians' services, and Medicaid eligibility is largely income-based, the strength of private demand and the size of the Medicaid program should be inversely correlated--at least within states.* For this reason, we would expect both participation rates and the number of LMPs to be higher in poorer neighborhoods, inner cities, and rural areas. This may be offset, on the other hand, by a shortage of physicians in these areas which has the effect of raising private demand and reducing Medicaid participation. Thus we have the rather surprising conclusion that the number of both nonparticipants and LMPs in a low-income, high Medicaid area may be higher than elsewhere if physicians are particularly scarce--as they generally are in these areas.

Summarizing on the demand side, our theory predicts that any factor raising (lowering) private demand (e.g., income, insurance, health status, credentials and specialization, the physician/population ratio) should decrease (increase) the probability of participation and the practice being an LMP, ceteris paribus. Similar predictions obtain for an increase in Medicaid fees. Extensions in program eligibility, by contrast, should have more of an effect on the size distribution of Medicaid practices, essentially skewing the distribution towards more LMPs.

## Discrimination

The analysis so far has implicitly assumed physicians do not discriminate among patients on factors other than ability to pay. Some physicians, however, may have a distaste for Medicaid patients or the program as a whole. Some of their reasons may be objective (e.g., fee schedules too low, long payment delays, too much red tape, few Medicaid eligibles), others' more personal. In the 1975 physician survey, nearly 40 percent of nonparticipants cited an "opposition to government in medicine" as a very important reason for not participating in the Medicaid program. Twenty-five percent also cited a "dislike for the kinds of patients enrolled" as a reason for not participating (Sloan, Cromwell, Mitchell 1978, p.122). Subjective responses like these strongly suggest that physicians discriminate against Medicaid patients for one reason or another.

Faced with a stated Medicare fee, $f_m$, some physicians act as if $f_m(1 - d_i)$ were the net fee, where $d_i$. reflects the strength of the i-th physician's discrimination coefficient a la Becker (1957).**

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*States vary considerably in the size of their programs, and it is possible that income and program size are uncorrelated across states.

**While $d_i$ is usually defined in terms of subjective preferences, real costs associated with the administration of the Medicaid program which lower net returns (e.g., complicated forms, payment delays) are comingled with preferences and are very difficult to disentangle.

This has the effect of lowering the flat Medicaid portion by an amount, $f_m d_i$, which will clearly vary by individual physician (unlike $f_m$ which all physicians receive as a nominal payment*). The effect of discrimination will be to lower participation and physician gross revenues, but not always. Consider Figure III-4. It is immaterial whether physician with supply SS is a discriminator or not, for he is a nonparticipant in Medicaid in any event. For physicians with supply S'S' or S"S", it does make a difference. The "potential" SMP physician with supply S'S', if he had a positive discrimination coefficient, $d_i$, would not participate in Medicaid, even though he ought to on objective financial grounds. The "potential" LMP physician with supply S"S" would only be an SMP, choosing instead to move further down his private demand curve by an amount $V_3-V_1$, before (begrudgingly) entering the program.

Discrimination in this context would cost the physician. How much depends on the elasticity of supply and private demand and his discriminatory preferences.** If supply were perfectly inelastic at $V_2$ visits, total revenues without and with discrimination would be $f_m V_2$ and $f_m(1-d_i)V_3 + f_m(V_2 - V_3)$, assuming no price discrimination among private patients. The revenue loss in this case would be $d_i V_3$. If supply were positively sloped (say S"S"), then, with discrimination, revenues would fall by an amount, $f_m d_i V_3 + f_m(V_2 - V_4)$ to $f_m(1-d_i) V_3 + f_m(V_4 - V_3)$. Costs would also fall as total visits declined, but net incomes are still clearly less than they could be without discrimination.*** *Ceteris paribus*, the more elastic is the physician's private demand, the greater the revenue loss from discrimination. Graphically, this can be seen by rotating private demand counter clockwise around A, the "drop-out" kink without discrimination. This has the effect of shifting $V_3$ to the right with discrimination, thereby raising the number of private patients who are all being charged the lower $f_m(1-d_i)$ fee. Intuitively, with a more elastic private demand, the discriminating physician who lowers his fee will pick up a larger number of private patients, reducing the number of Medicaid patients he will see at the higher Medicaid fee, assuming a fixed, or reduced number of total visits. Private revenues will be greater, of course, but they will be more than offset by reductions in Medicaid revenues.

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*Actually all physicians would receive $f_m$ if no specialty or physician-specific differences in allowable fees existed. Medicaid programs do make specialty distinctions. In addition, many use UCR reimbursement techniques based on individual physician profiles.

**For a mathematical treatment in the context of employer discrimination, see Thurow, (1969, p.115).

***By discriminating, the physician gives up $f_m d_i V_3 + f_m d_i (V_2 - V_4)/2$ in net gains, the second element is an approximation of the producer's surplus triangle, assuming a roughly linear supply segment between $V_4$ and $V_2$ visits.

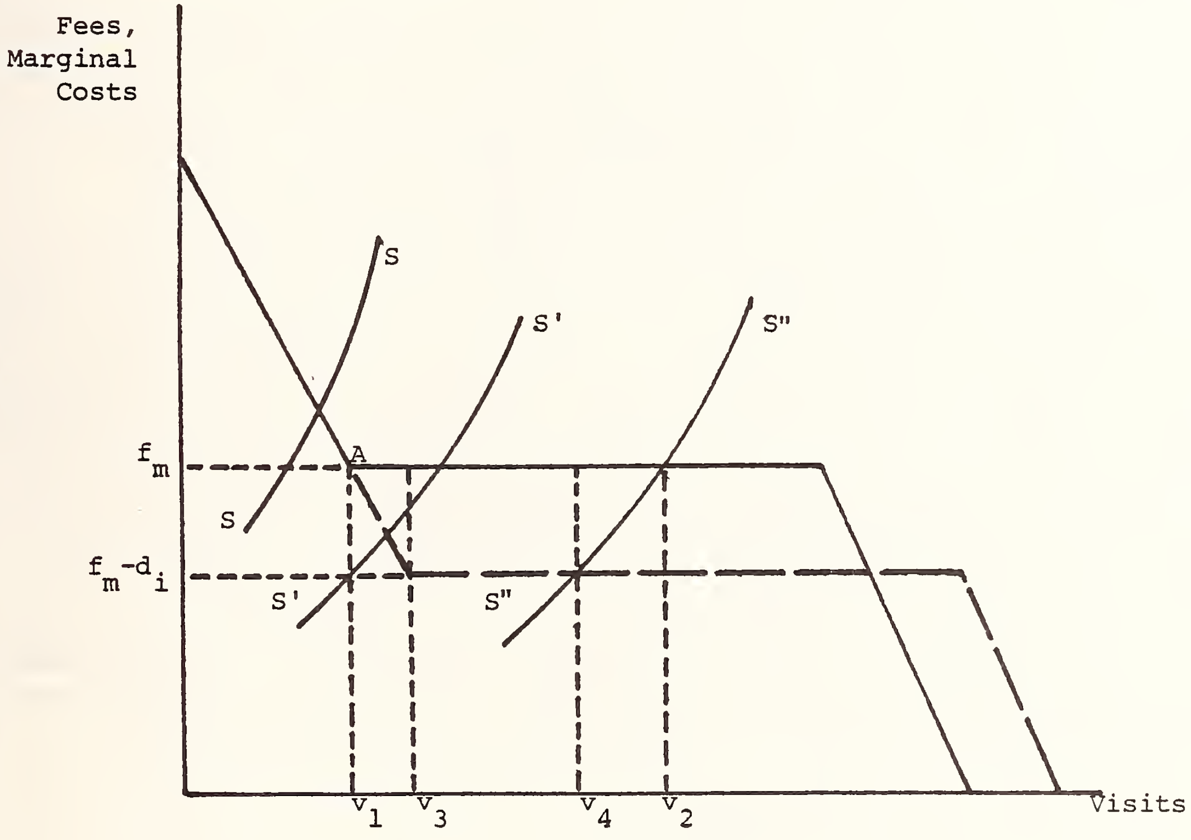

Figure III-4: THE IMPACT OF DISCRIMINATION ON MEDICAID PARTICIPATION AND LMPs

Economic losses to physicians will naturally increase with $d_i$, the discrimination coefficient. In the extreme where $d_i > f_m$, the physician would limit himself strictly to non-Medicaid patients no matter his supply. For these physicians the economic loss could be a tremendous price to pay for refusing to accept Medicaid patients, particularly if private demand were limited. This does not necessarily mean that the physician is not seeing poor patients. On the contrary, he may be seeing many of the poor. He is just not receiving directly from them as much as he could if he had chosen to accept them as Medicaid patients.

The size distribution of Medicaid practices will vary depending on the mean and variation in $d_i$. Without discrimination, a distribution of physician supply as in Figure III-4 would show one nonparticipant (SS), one SMP (S'S') and one LMP (S"S"). If all three physicians had the same discrimination coefficient, $d_i > 0$, then there would be two nonparticipants (SS and S'S') and one SMP (S"S"). Presumably a greater unmet need for ambulatory physician services would result. If some physicians discriminated and others did not, then the size distribution would depend on the correlation of supply and discriminatory preferences. If, for example, physician SS in Figure III-4 discriminates but the other two do not, then the size distribution is unaffected. If on the other hand, S'S' and S"S" were the only discriminators, then one would drop out of the Medicaid market (S'S') and the other would shrink to an SMP. Holding other factors like private demand and the distribution of supply constant, an inverse correlation between discriminatory preferences and supply (i.e., smaller suppliers with a greater distaste for the Medicaid program) should result in greater inequalities in Medicaid practice size. In this case, there should be more nonparticipants and fewer SMPs, leaving the bulk of the Medicaid population to be served by LMPs. A greater average level of discrimination would have a similar effect while a positive correlation between discriminatory preferences and private demand would reinforce both as discriminators enjoy a more lucrative private practice, leaving nondiscriminators lacking wealthy private patients to treat the Medicaid population.

## Variations in Physician Supply

The ultimate impact of any shift in private or Medicaid demand on Medicaid participation rates will depend on the distribution of supply in a particular area. Referring back to Figure III-2 if all physicians everywhere exhibited supply S'S', then each physician in a low demand area ($D_1D_1$) would be running a small Medicaid practice while no Medicaid patient would be seen in physicians' offices in high demand areas ($D_2D_2$). If, at the other extreme, all physicians exhibited supply SS, then all physicians would be operating LMPs in low demand areas and SMPs in high demand areas.

Within any geographic area a natural distribution of supply curves is more likely the case, based on the distribution of underlying cost characteristics. Consider Figure III-5 which shows two families of supply curves, each depicting three physician practices. The set of practices on the right are willing and able to supply considerably more visits than those on the left and, hence, have been designated LMPs. If the distribution of supply in a market area with low private demand $D_1D_1$ were as 1, 2, 3, we can see that all three practices would be SMPs to varying degrees: the participation rate of 3 is greater than 2 is greater than 1.

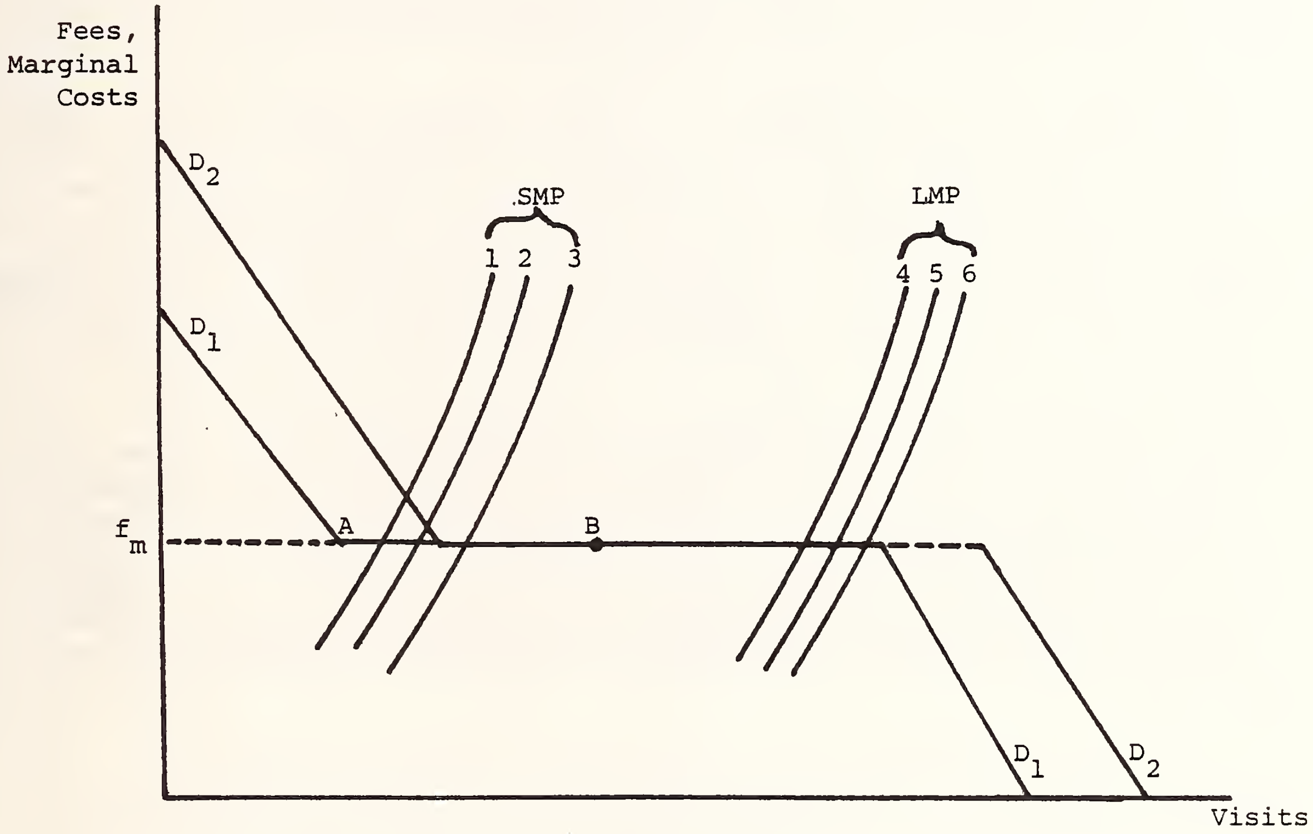

Figure III-5: DISTRIBUTION OF PHYSICIAN SUPPLY, MEDICAID PARTICIPATION RATES, AND LMPs

If supply were distributed as 4, 5, 6, then all practices would be LMPs in area 1.* In a high demand area $D_2D_2$, two practices would be non-participants if practices 1,2, and 3 were serving the community and one, practice 3, would be a very small SMP. If LMP practices prevailed in area 2, then all three would still be LMPs, although participation levels would be less because private demand is stronger. Thus, we can see in Figure III-5 how the relative number of LMPs depends on the locus of supply relative to the private demand-Medicaid fee kink, or the "drop-out" kink. When all practices exhibit supply curves closely bunched around practice 2, Medicaid participation will be zero or quite small while if they are bunched around practice 5, most practices will be LMPs.

The SMP and LMP distributions in Figure III-5 are relatively tight which is unlikely to be the case in any given area. Physicians vary greatly in their ability to manage practices efficiently, in their use of auxillary inputs, and most importantly, in their preferences for income and leisure. Suppose practices were distributed as 1,2,5, and 6 rather than tightly bunched. Then in area 1 ($D_1D_1$)practices 1 and 2 would be SMPs and 5 and 6, LMPs. In area 2 ($D_2D_2$), practices 1 and 2 actually would be nonparticipants and 5 and 6 still LMPs. Other distributions would give different results. If the distribution of supply curves were uniformly distributed along the entire "visits" axis, then a complete mix of nonparticipants, SMPs, and LMPs would obtain. Shifts in demand would alter the mix, with increases in private demand (or reductions in Medicaid fees) resulting in more nonparticipants, fewer LMPs, and more or less SMPs depending upon both the distribution of SMPs around the "drop-out" kink and the distribution of LMPs around point B, the point where an SMP becomes an LMP.** If practices are more closely bunched around A than B, then increases in private demand or Medicaid fee reductions should reduce the total number of SMPs and exacerbate inequalities in the distribution of Medicaid patients across physicians.

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*Medicaid patients constitute 10-15 percent of all private physician caseloads nationwide. If Medicaid patients and physicians were distributed equally across the general population, then participation rates should approximate 10-15 percent in any community. Because neither are very equally distributed, it is possible for all physicians *in an area* to be LMPs if few non-Medicaid patients exist. They would not have to be; need may simply go unmet as physicians choose to see a limited number of patients *in toto*.

**This point is clearly arbitrary. In the empirical work that follows, point B where an SMP becomes an LMP has been defined as either 30 or 50 percent of visits Medicaid. These percentage cutoffs were determined based on inspection of the size distribution of Medicaid participation.

The locus and distribution of supply, in turn, will depend on the mean of, and the variance in, the characteristics that underly physician supply. These characteristics can be decomposed into four categories: (1) non-physician input prices; (2) productivity; (3) preferences for income and leisure; and (4) practice style. In areas where auxillary wages are high, average supply should be less at any given fee, and we would expect the distribution of supply to be shifted to the left in Figure III-5. Similarly, where average productivity is low, supply would also be less as physicians would be financially limited in the visits they could provide for a given fee. Specialists, for example, see fewer patients per hour. Therefore, in specialist-dominated areas, we would expect more limited supply and lower participation rates, _ceteris paribus_. If physicians in an area also had a higher average preference for leisure (e.g., older, semi-retired physicians in Florida or Arizona), supply would be less than in areas where work (or income) preferences were stronger. Finally, in areas served by physicians whose practice style included a significant number of high quality inputs, amenities, and the like, supply would also be less as fees would cover only a limited number of more costly visits before marginal costs exceeded marginal revenues.

Variations in physician supply around the mean (say, practice 2 or 5 in Figure III-5) would be a function of variations in input prices, productivity, income-leisure preferences, and practice style. Presumably all practices in an area would face the same non-physician input prices although certain exceptions may exist (e.g., black physicians may have to pay higher wages to attract white RNs); thus, _within_ area _variations_ in factor prices should not be a major contributor to supply differences or to the number of LMPs, although they may explain much of the _inter-area_ variation.

Variations in physician productivity are considerable, however, as Reinhardt (1975) has shown. A considerable amount of this variation tends to be specialty-specific.* What output variation remains, and it is still considerable, would depend to a large extent on the physician's managerial capacities: does he use auxillary personnel, does he allocate his own time efficiently, does he use outside billing and collection agencies, etc.?

Physicians are also likely to vary considerably in the imputed wage they apply to their own effort, or their preferences for leisure. In addition to random variations in income-leisure preferences, physicians with significant non-practice income or who are elderly, or female physicians who have children they are responsible for raising should have a greater disutility for work, ceteris paribus.*

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*Within the five primary care specialties in our sample, the number of weekly visits varied from 191 for general practitioners down to 145 for internists and OB-GYNs. Within the medical specialists, weekly visits ranged from a high of 163 for dermatologists to 117 for gastroenterologists. Among surgical specialists, the range was from 142 for orthopedic surgeons to 117 for neurosurgeons. Psychiatrists were the lowest by far, reporting only 56 total visits.

Finally, and most important from a policy perspective, physicians vary in their choice of practice style, partly out of training and specialty choice, partly out of a desire to increase incomes. Variations in practice style include the time physicians spend with patients, the ancillaries they order, the quantity and quality of labor inputs used, the size of waiting rooms, and the like. Consider first the use of ancillaries. The analysis so far has focused exclusively on physician visits without any consideration of ancillary services, such as laboratory tests, injections, and x-rays. As they are usually billed separately, it is appropriate to consider ancillaries a second output of the physician's practice, essentially complementing direct patient consultations. Physicians may or may not internalize ancillary services.** If they do not, no financial benefit would derive from ordering tests and procedures unless illicit kickbacks were being paid. Where physicians do produce ancillaries in their offices, they have a direct financial interest in the allowed charges of third party payors and in production costs. A strict profit-maximizer with independent demands for visits and ancillaries (say, an outside laboratory) would produce tests and procedures to the point where marginal revenues equalled marginal costs. But physicians who internalize ancillary services (a) face an ancillary demand curve that depends on the number of patient visits produced, and (b) have considerable discretion over demand because of consumer ignorance. More laboratory tests can be ordered, for example, if physicians see more patients or decide patients need more tests of a particular type.

One way of theoretically incorporating internalized ancillary services in in the model would involve a second graph of ancillary demand and costs. As patient visits increased, demand for ancillary services would shift out and average costs would decrease, increase or stay the same depending on the shape of the cost function. Presuming ancillary prices are greater than average costs over the relevant range of ancillary output, physicians would enjoy a profit by internalizing ancillaries. Thus, for each level of patient visits, physicians would receive a visit fee plus an average markup on ancillaries, resulting in a "total" visit price. The effect of internalizing ancillaries should be to shift final visit demand outwards, resulting in more visits being provided (assuming positively sloped supply curves). This is shown in Figure III-6. The solid line $D_vD_v$ represents the private and Medicaid demand for visits, while dashed line $D_aD_a$ is $D_vD_v$ plus an average ancillary profit, $\pi_{anm}$, for private visits and $\pi_{am}$ for Medicaid visits. For simplicity a constant profit independent of visit volume is assumed. Furthermore, $\pi_{am}$ is assumed less than $\pi$ anm if Medicaid ancillary fees are less than private fees. $\pi_{am}$ and $\pi_{anm}$ equal $k_mr_a$ and $k_{nm}r_{anm}$, respectively, where $k_i$ = the average ancillary intensity per visit and $r_i$ = the average markup.

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*For evidence on this point, see Sloan (1973, 1975) and Sloan, Mitchell, Cromwell (1978).

**For reasons why they might or might not, including such variables as practice size and specialty, see Ernst (1976).

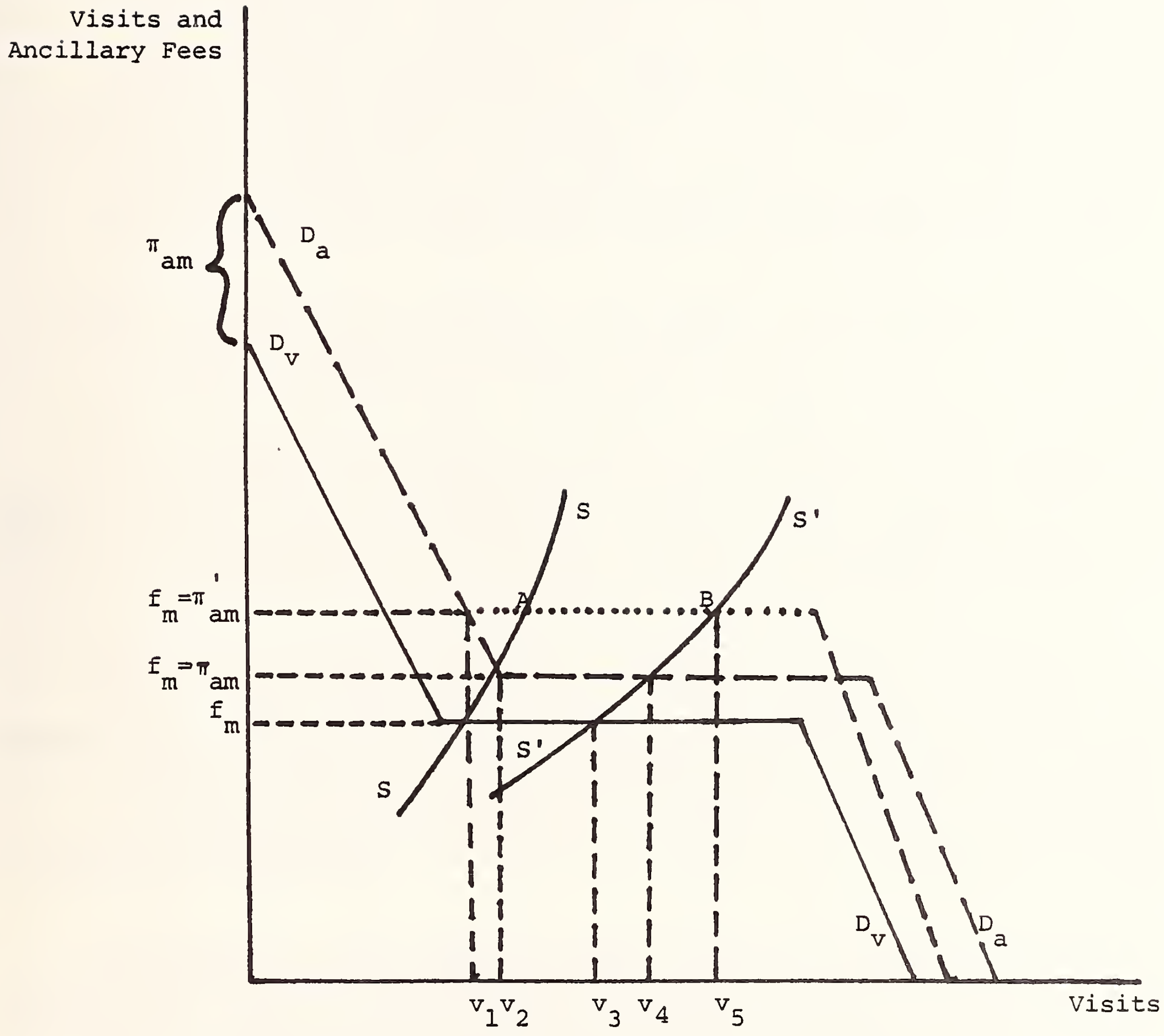

Figure III-6: ANCILLARY MARKUPS, MEDICAID PARTICIPATION AND LMPs

Any positively sloped supply curve will intersect $D_aD_a$ further to the right of $D_vD_v$, as physicians internalizing ancillaries find it financially beneficial to see more patients. If supply were SS, the effect of internalizing ancillaries would be to discourage Medicaid participation: SS would intersect the falling portion of $D_aD_a$ rather than the horizontal Medicaid segment of $D_vD_v$. The marginal physician internalizing ancillaries would have less of a need or desire to enter the Medicaid market as marginal revenues per private visit are higher. Physicians internalizing ancillaries would not enter the Medicaid market until $V_2$ private visits were provided. If supply were S'S', the effect of internalizing ancillaries would be to increase total visits from $V_3$ to $V_4$ while decreasing Medicaid participation because private patients are relatively more lucrative. Declining participation due to internalizing ancillaries would not necessarily occur if private demand were very inelastic, if Medicaid ancillary fees were high, or if supply were very elastic.

Ancillary intensity per visit, $k_i$, has been assumed constant, albeit different for Medicaid and non-Medicaid patients (possibly due to casemix differences). Given a certain patient casemix, we should expect considerable variation in ancillary utilization per patient, or per visit, depending on specialty, training and patient income. Nevertheless, appropriateness "norms", however ill-defined, do exist and unnecessary utilization could be measured in theory by a panel of physicians reviewing a physician's casemix. Physicians who systematically exceed these norms could be considered inducing ancillary demand beyond the "appropriate" level, presumably in an effort to increase practice net revenues.

The effect of abusing utilization by Medicaid physicians is shown in Figure III-6 by an arbitrary increase in ancillary intensity per visit, $k_{am}$, resulting in an upward shift in Medicaid demand by $(\pi'_{am} - \pi_{am})$.* Engaging in such behavior will result in earlier participation in the program (point A on supply SS) or greater participation if the physician were already participating (point B on S'S'). In the case of the participating physician S'S', total visits would increase from $V_4$ to $V_5$, Medicaid visits by an amount $(V_5 - V_4) + (V_2 - V_1)$, and his participation rate would increase to $(V_5 - V_1)/V_5$.

Other differences in practice style like time spent with patients, use of support personnel, and amenities can be characterized as supply shifts. Physicians who see patients on an assembly-line basis, and who skimp on needed auxillary personnel can certainly see more patients per hour at lower incurred costs. The higher net incomes enjoyed, however, come primarily at the patients' expense and would not be condoned by the majority of medical professionals. Minimum acceptable standards of ambulatory care, if applied rigorously in physicians' offices, could eliminate disreputable behavior. Standards would also limit physician supply--particularly to the Medicaid market which absorbs the residual of practice inputs after serving better paying, private patients.

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*Physicians could overprescribe ancillary tests and procedures for private patients as well (some probably do even beyond the practice of defensive medicine), but positive out-of-pocket payments, better educated consumers, and peer pressures exerted through private referral patterns, are believed to constrain the physician more in treating his private patients.

## Motives, Characteristics, and Behavior of Large Medicaid Practices

Large Medicaid practices (LMPs) and "Medicaid mills" have generally been considered synonymous; they are characterized as assembly-line operations run by second-rate physicians. Does the very fact that a physician treats a disproportionate number of Medicaid patients mean that he is providing inferior care? Or is the care in LMPs basically similar to that provided in other practices? Economic theory identifies a number of factors that increase the probability that LMPs will develop in a community. Some of these, such as limited private insurance and low wage rates are neutral regarding the nature of care delivered. Other factors, such as credentials, may imply lower quality care in LMPs because of limited training. Still other factors, like strong income preferences, coupled with a questionable practice style, suggest a truly unacceptable mode of care. To better understand why LMPs exist and behave the way they do, we need to consider the motivational and historical circumstances underlying them. Knowing more about how LMPs have developed will help us interpret the descriptive data that follow as well as making some predictions about the future. In addition, we may be able to determine whether all large Medicaid practices are in fact mills.

We already believe that LMPs should be more prevalent in areas of low private demand, particularly inner cities and rural areas, either because input prices are likely to be lower or the Medicaid pool larger. Characteristics of physicians choosing to locate there may vary considerably along such dimensions as productivity, work effort, and practice style. Consider three types of LMP, two established by design, another by historical accident. In the first two cases, a physician (or group of physicians) chooses to set up practice in a Medicaid area either to serve the poor out of charitable motives or to maximize incomes by taking advantage of a medically unsophisticated, fully insured population. This second motive is usually attributed to physicians managing Medicaid mills. Third, there is a group of older LMP physicians who have been isolated in rural and inner-city areas by historical changes outside their control, and are now serving a predominantly poor population. Let us examine these three groups separately.

The first group are mostly young family practitioners or other primary care specialists who have chosen to practice in a low-income community for altruistic reasons. In some instances, these physicians may be fulfilling commitments to practice in medically underserved areas as part of federal loan forgiveness or other educational subsidy programs. Because this group is younger, they will have been trained in the most up-to-date medical technology; many will be board-certified and all will be affiliated with a hospital. These physicians are expected to be working long hours in direct patient care, employing auxillary labor inputs, and recommending ancillary services only as appropriate. Mark-ups to private patients should be limited, and net incomes in line with training and work effort.

The second type of LMP consists of physicians who have located in poor communities for avaricious reasons, i.e., to maximize net incomes. Although these physicians may be of any age or specialty, they should have fewer credentials, e.g., no board-certification, no hospital affiliations, and with foreign medical school training. These physicians may be unable to compete effectively in the private market with other, better trained physicians and thus move into the Medicaid market. Here, they can still achieve high net incomes by simultaneously shifting demand in the aggregate and reducing the intensity of inputs on a per patient basis. Specifically, they make extensive within-practice referrals and order unnecessary ancillary services. At the same time these practices skimp on inputs of all kinds; physicians spend little time with patients (although total hours worked may be long) and employ few auxillary aides. Mark-ups charged to private patients will be high. Net incomes will be exceptionally high, either directly or indirectly through incorporation. In short, they are operating Medicaid mills.

The third group of physicians may have large Medicaid practices simply by force of historical and geographic circumstances. These physicians may be aging general practitioners who established their city practices a generation ago. When the middle class moved out to the suburbs, they were either unable or unwilling to follow them. With increasing medical school control of inner city hospitals, these physicians gradually lost their hospital privileges to the specialists. Their lack of technical skills forced them out of the competitive market for acute care physician services; in short, they had become technologically obsolete. These physicians now provide access to ambulatory care for the low-income population residing in the inner city, a predominately Medicaid population. Besides this small group of aging general practitioners, the only alternative sources of care may be the higher-priced hospital outpatient clinics and emergency rooms. Similarly, rural areas are increasingly served by older general practitioners, as younger and specialist physicians opt for urban/suburban practice. At the same time, migration from rural communities has left these general practitioners with a relatively poor patient population, a group now covered by Medicaid. This group of accidental LMPs will tend to be solo practitioners. Although working longer hours, they will be less productive, employing few auxillary staff and spending more time on paperwork. Rates of ancillary utilization will be low, mark-ups to private patients low, and net incomes below average.

In sum, we hypothesize three distinct motivations behind LMPs. The first is altruism: young physicians choosing to locate in poor areas, providing ambulatory care at a reasonable price where it is most needed. The second is accidental: older physicians remaining in rural and inner city areas because of physical, social, or financial immobility, and having to serve an increasingly poor population. Finally, the third is avarice: physicians of any age choosing to enter poor communities, not so much to serve, as to maximize incomes.

Because we cannot readily discern motives (certainly we cannot expect physicians running Medicaid mills to admit their true motives), we must draw inferences based on achieved characteristics and revealed behavior. How might Medicaid mills differ from the other two kinds of LMPs? Lengths of visits with physicians should be shorter, and profitable ancillary services should be prescribed beyond medically indicated levels.

Practice amenities may also be limited (e.g., small, crowded waiting rooms, unsanitary conditions). Physicians may be skimping on the quantity and quality of inputs (e.g., outmoded equipment, using few staff, using LPNs rather than RNs).

All of these criteria involve the process of medical care, and not physician training or background. While Medicaid mills may be run by "incompetent" physicians, this is not necessarily the case. Age clearly would not distinguish a mill from an accidental LMP; mills may be run by young and old physicians alike, nor is FMG status, or lack of board-certification, or specialty, a definitive mill characteristic. Medicaid mill physicians may be less well trained on average because they have been driven out of the competitive private market, but inferior training is not a necessary condition. Older, immobile physicians are also less well trained, but they are not necessarily running mills.

Finally, it seems reasonable to assume that Medicaid mill physicians are successful at what they do. That is, we would expect them to be earning higher incomes on the average, than physicians in the other two kinds of LMP.

## IV. DATA SOURCES

### Physician Survey

The primary data base for this analysis is the 1976 physician survey conducted by the National Opinion Research Center (NORC) for the Health Care Financing Administration (HCFA).* This survey was a nationally representative sample of 3482 physicians in fifteen specialties. These specialties included: allergy, cardiology, dermatology, gastroenterology, general/family practice, general surgery, internal medicine, neurological surgery, obstetrics-gynecology, opthalmology, orthopedic surgery, otolaryngology, pediatrics, psychiatry, and urology. All physicians were in private practice, and the vast majority were office based (95.8%). Group practices with ten or more physicians were excluded.

A stratified-element (non-clustered) sampling procedure was used in which the strata were defined by specialty, geographic region, and county group size. In order to ensure that there would be sufficient cases for some analyses, certain strata were oversampled. Allergists, for example, were sampled at a higher rate than the more prevalent internists. In order to adjust for this disproportionate allocation, "weights" have been used in all analyses reported here. These weights serve to inflate the sample physicians to the larger physician population from which they were drawn. As the degrees of freedom for significance testing would also be inflated, the weights have been "normalized" by a constant n/N where n is the actual number of sample observations and N represents the population estimates obtained with the weights.

An extensive questionnaire was administered to all physicians, usually by telephone. This questionnaire included data on practice costs, work effort, size and type of practice, physician income, and fees. All information was based on physician self-reports. The size distribution of Medicaid practices was calculated from the individual physician's response to the following question: "About what percentage of your patients have Medicaid?" This percentage was assumed to accurately reflect the share of physician work effort devoted to Medicaid patients. Data on the actual number of visits rendered to Medicaid patients are not available from the 1976 survey. If physicians provided disproportionately more services to their non-Medicaid patients, however, the extent of physician participation in Medicaid programs would be overestimated.

In order to assess the extent of bias in the 1976 survey (if any), two alternative specifications of Medicaid participation were compared using the 1975 NORC sample: (1) the proportion of patients who receive Medicaid (mean of 10.9 percent); and (2) the proportion of total visits provided to Medicaid patients (11.1 percent). A t-test of means showed no significant differences, supporting our use of "patients treated" as an unbiased estimate of Medicaid practice size.

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*Data collection actually took place in 1977; cost and income data refer to the previous calendar year, hence its desingation as a 1976 survey. All other data, such as fees and visits, refer to the actual year in which they were obtained (1977).

## Measurement Error

Measurement error may be present if physicians refused to participate in the survey, or if they reported inaccurate or incomplete information during the interview.* If non-respondents differ from survey physicians in ways that are correlated with differences in Medicaid participation, then estimates of large Medicaid practices may be biased. Given the negative publicity surrounding large Medicaid practices, physicians with such practices might be more reluctant participants. It is unlikely, however, that any significant nonresponse bias has been introduced, for several reasons. First, the explicit objective of the survey was not to investigate such practices, and in fact included only a single question on the extent of Medicaid participation. Second, analysis of the 1975 physician survey found that non-respondent physicians did not differ from cooperating physicians along characteristics believed to be associated with large Medicaid practices, such as specialty, board-certification, and FMG status (Sloan, Cromwell, and Mitchell, 1978). Finally, the weights associated with the 1976 sample include adjustments for nonresponse.

Another source of potential error is the extent of under- or overreporting by physicians who did take part in the survey. Two areas of particular concern are physician net income and work effort. In order to assess the accuracy of survey responses, AMA mailed questionnaire data on physician incomes and hours of work were used for comparison (AMA, 1979). The four primary care specialists in our study reported means of 47-50 hours spent per week in direct patient care. This compared quite favorably with 45-49 hours reported to the AMA by its survey physicians. AMA study general practitioners stated they worked 47 hours, however, considerable less than the 52 hours reported by NORC general practitioners. At least part of this difference can be attributed to the fact that more of NORC respondents were located in rural areas, where physicians traditionally have worked longer hours. AMA data on net incomes are available only for the year preceding the NORC survey (1975). Our pediatricians and general practitioners reported net incomes about 8 percent higher than those reported to the AMA, a fairly reasonable estimate of inflation. The other three specialties had net incomes that were 5-8 percent lower than those of AMA survey physicians.

## Secondary Data Sources

Three additional data sources were merged with the physician survey for this analysis. Biographic information on individual survey physicians was obtained from the AMA Masterfile, including such data as physician age, board-certification, and medical school. Variables describing the physician's county, such as demographic characteristics, were drawn from the Area Resource File. Two community variables, per capita income and physician-population ratios, were obtained from a more up-to-date source: the AMA's Physician Distribution and Medical Licensure in the U.S., 1976.

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*These types of errors are known as non-response bias and field bias, respectively. For a discussion of all types of measurement error and for a more detailed analysis of potential sources of bias in the 1975 physician survey, see Sloan, Cromwell, and Mitchell (1978 , (pp. 14-21).

## Implications of Sample Design for Analysis of Large Medicaid Practices

Because the survey of physicians constitute a nationally representative sample, we can be confident about generalizing from our results on large Medicaid practices. It is possible, however, that a particular type of large Medicaid practice was systematically excluded by the sampling criteria, e.g., the inner city shared health facility typified by Senator Moss as a mill in his investigations. The NORC survey unfortunately was limited to practices with nine or fewer physicians. Yet it is unlikely that SHFs are usually composed of ten or more physicians.

The sample design also excluded any organizational form other than a solo, partnership, or group practice arrangement. If physicians interviewed at a shared health facility identified themselves as a medical clinic, rather than a group practice, they would have been dropped from the survey. NORC reports, however, that sample ineligibility rarely resulted from the use of this criterion. Ineligibility more frequently occurred because the physician had not been in practice for the year preceding the interview, did not provide private practice care, or because he worked fewer than 20 hours a week.

## V. OVERVIEW OF LARGE MEDICAID PRACTICES

Policymakers have been concerned that a small number of physicians run disproportionately large Medicaid practices, and that these practices are "mills" in which poor quality care is provided. Who are these physicians? Do they earn unusually high incomes through large patient loads and excessive use of ancillary services? Are they technically marginal practitioners located in low-income areas where they naturally draw upon Medicaid patients? An analysis of these large Medicaid practices is presented below.

### Sample Description

Due to distinct differences in practice styles and casemix that are expected to influence Medicaid behavior, it is useful to examine large Medicaid practices in four subsamples:

(1) Primary care physicians - general practitioners, general surgeons, internists, obstetrician-gynecologists, and pediatricians;

(2) Medical subspecialists - allergists, cardiologists, dermatologists, and gastroenterologists;

(3) Surgical subspecialists - neurosurgeons, opthalmologists, orthopedic surgeons, otolaryngologists, and urologists; and

(4) Psychiatrists - including both adult and child psychiatrists.

Primary care physicians are generally the first point of contact within the health care system, and they treat a wide variety of medical problems. Patients are likely to seek care directly from these physicians, e.g., on a walk-in basis, without a referral, etc. Because access to these physicians is easier, we would expect them to have higher rates of Medicaid participation on average. Access to subspecialists services on the other hand, is generally mediated by a primary care physician (Rushing, 1975). Medicaid participation rates across specialties thus may be positively correlated within a given community, as subspecialists are likely to receive a Medicaid patient only upon referral from another physician who treats Medicaid patients.*

The locus and style of practice vary across the subspecialist groups in ways that may influence practice costs, use of ancillary services, and other variables of analytic interest. Surgical specialists, for example, provide a large proportion of their visits on an inpatient basis, where they can make extensive use of hospital inputs. By contrast, medical specialists rely more heavily on diagnostic tests and other ancillary services performed in the office setting. For the third group of specialists, the psychiatrists, their own time is the primary practice input. Office visits are long, and ancillary services almost non-existent. As a result of the referral process, furthermore, all subspecialists are likely to treat more complex, serious cases.

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*Some Medicaid patients will bypass this referral system by seeking care from the emergency room. If their condition is sufficiently serious, they would see a subspecialist almost immediately.

The analysis reported in this chapter is based on an unweighted total sample of 3,310 physicians. Individual cell totals for the four subsamples and for the Medicaid practice size groups are shown in Table V-1.* These observations are unweighted and proportions should not be calculated from them. Percentage distributions based on the weighted sample are presented in Table V-3. Due to the relatively small number of observations in those cells, large and extra-large Medicaid practices will be combined for analyses of the three subspecialty groups.

## Size Distribution of Medicaid Patients and Physicians

The size distribution of Medicaid practices is shown in Figure V-1. The numbers at the top of each bar represent the percent of total physicians in the Medicaid practice size class. The deciles along the abcissa represent the percent of practice patients who receive Medicaid. The histogram displays a marked right skew; almost one-fourth of the sample (23%) report that they do not treat Medicaid patients. Most participating physicians have fairly small Medicaid practices, and we observe a marked discontinuity at 30 percent.

For purposes of this analysis, large Medicaid practices (LMPs) will be defined as those in which 30 percent or more of the physician's patients receive Medicaid. Thirty percent is a full standard deviation above the mean percentage of Medicaid patients in a practice (12.7%). Approximately fourteen percent of sample physicians fall into this "outlier" category. Caseloads average 42 percent Medicaid patients, making them _a priori_ suspect in the eyes of policy makers. It is plausible, however, that practices with an even higher concentration of Medicaid patients may share more of the characteristics associated with a mill. In order to test this, physicians with "extra-large" Medicaid practices (ELMPs), those with at least one-half of their practice devoted to Medicaid patients, are also compared. For this group of physician, Medicaid patients constitute 59 percent of total caseload.

The histogram in Figure V-1 clearly demonstrates the unequal size distribution of Medicaid practices. What is the distribution of Medicaid _patients_ across these practices, however? It is possible that large Medicaid practices treat only a relatively small proportion of total Medicaid patients. If so, policy-makers might be less concerned about the possibility that these large Medicaid practices are mills. Using Medicaid mix and caseload data, a Lorenz curve was constructed measuring inequalities in the distribution of Medicaid patients across physicians (Figure V-2). The cumulative percentage of Medicaid patients

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*These practice size groups are defined in the following section. Briefly, small Medicaid practices are those with less than 30 percent Medicaid patients; large, 30-49 percent; and extra-large, those with 50 percent or more Medicaid patients.

TABLE V-1:

UNWEIGHTED SAMPLES BY MEDICAID PRACTICE SIZE

| Medicaid Practice Size / Sample | None | Small | Large | Extra-Large | Total |
|---|---|---|---|---|---|
| Primary Care | 374 | 1150 | 184 | 88 | 1796 |
| Medical Specialties | 104 | 292 | 28 | 9 | 433 |
| Surgical Specialties | 100 | 489 | 65 | 20 | 674 |
| Psychiatry | 145 | 206 | 35 | 21 | 407 |
| Total | 723 | 2137 | 312 | 138 | 3310* |

*172 physicians were dropped, due to missing data.

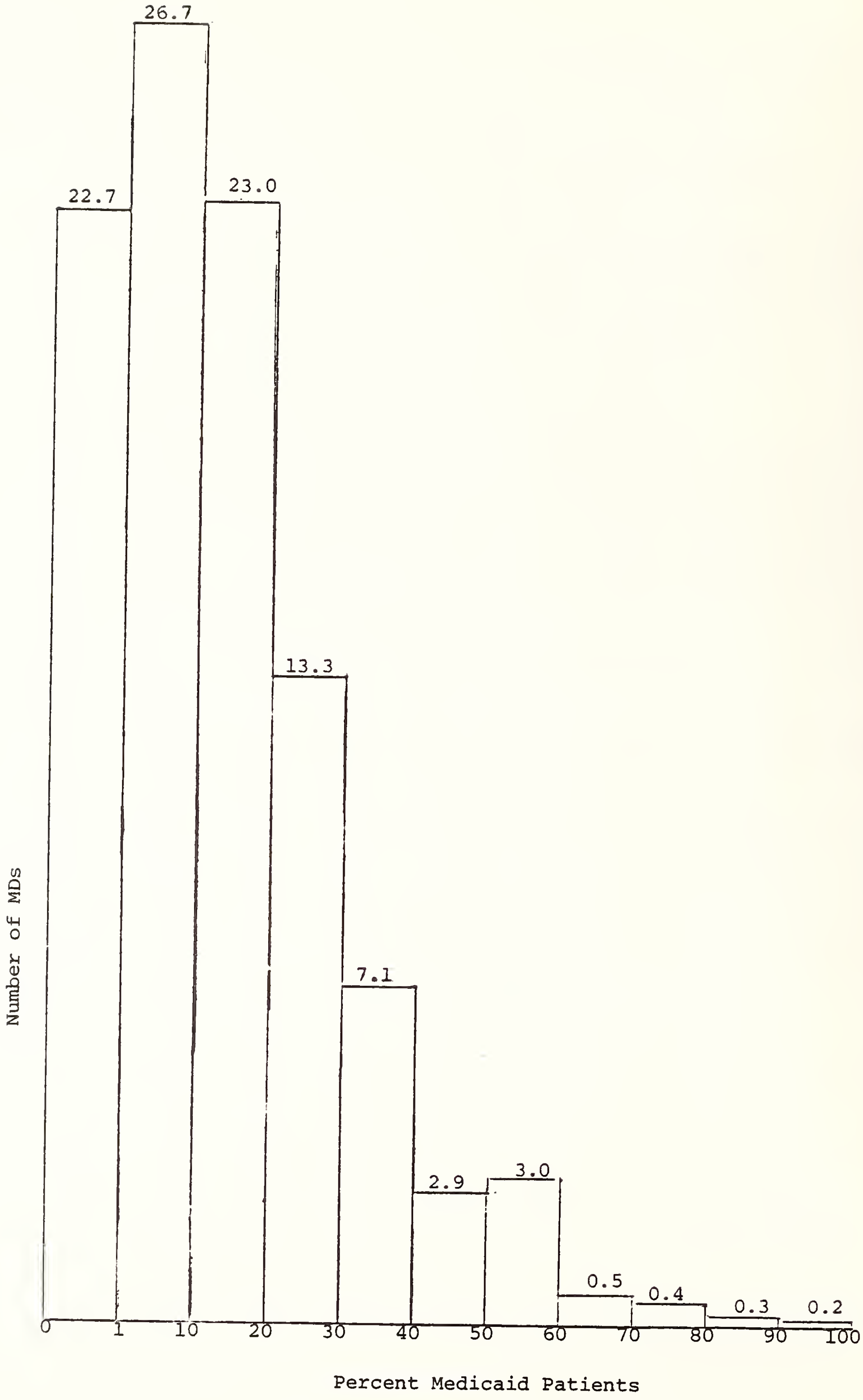

Figure V-1

MEDICAID PARTICIPATION RATE FOR
ALL PHYSICIANS

in physicians' practices (calculated in vingtiles) is plotted along the Y-axis, and the cumulative percentage of physicians along the X-axis. (For comparison purposes, Lorenz curves for Medicare and Blue Shield patients are also presented.) If Medicaid patients were perfectly distributed across practices, all would be small Medicaid practices (SMPs) and the Lorenz curve would coincide with the straight diagonal line. In fact, the observed distribution indicates considerable unevenness in the distribution of Medicaid patients. Three-quarters of sample physicians care for only 26 percent of the total Medicaid population. Almost one-third (31.8%) of all Medicaid patients, on the other hand, are treated by 5.5 percent of the physicians. A small number of physicians appear to have assumed responsibility, whether through accident, altruism, or avarice, for a large proportion of the nation's poor.

The Gini Index of Concentration provides a summary statistic of the extent of inequality shown by the Lorenz curve, and is calculated as the ratio of the area between the diagonal and curved line to that of the total triangle. It ranges from zero to one, with zero representing complete equality (i.e., the curved line lies on the diagonal) and one perfect inequality. The Gini coefficient for Medicaid patients is 0.6520 indicating considerable maldistribution. By contrast, the Gini coefficient for physician distribution is 0.1558 (Morrow, 1977), indicating that physicians are much more evenly distributed across the population generally than are Medicaid patients across physicians. For reference, we note that the distribution of both Blue Shield and Medicare is more even than Medicaid, although significant inequalities still remain. The Gini coefficients for Blue Shield and Medicare patients are 0.4649 and 0.5419, respectively.

The Lorenz curve suggests the LMP physicians not only devote a large proportion of their practice to Medicaid, but that they also see the majority of all Medicaid patients. Table V-2 confirms that this is in fact the case. The "extra-large" Medicaid practices alone see 31.8 percent of all Medicaid recipients treated in private practices. Together with other LMP physicians, they provide care to over one-half of this Medicaid pool (58.4%). Analysis of these large Medicaid practices is certainly warranted for policy purposes. If even a minority of these LMPs are in fact Medicaid mills, the quality of care will be diminished for a very large number of public patients.

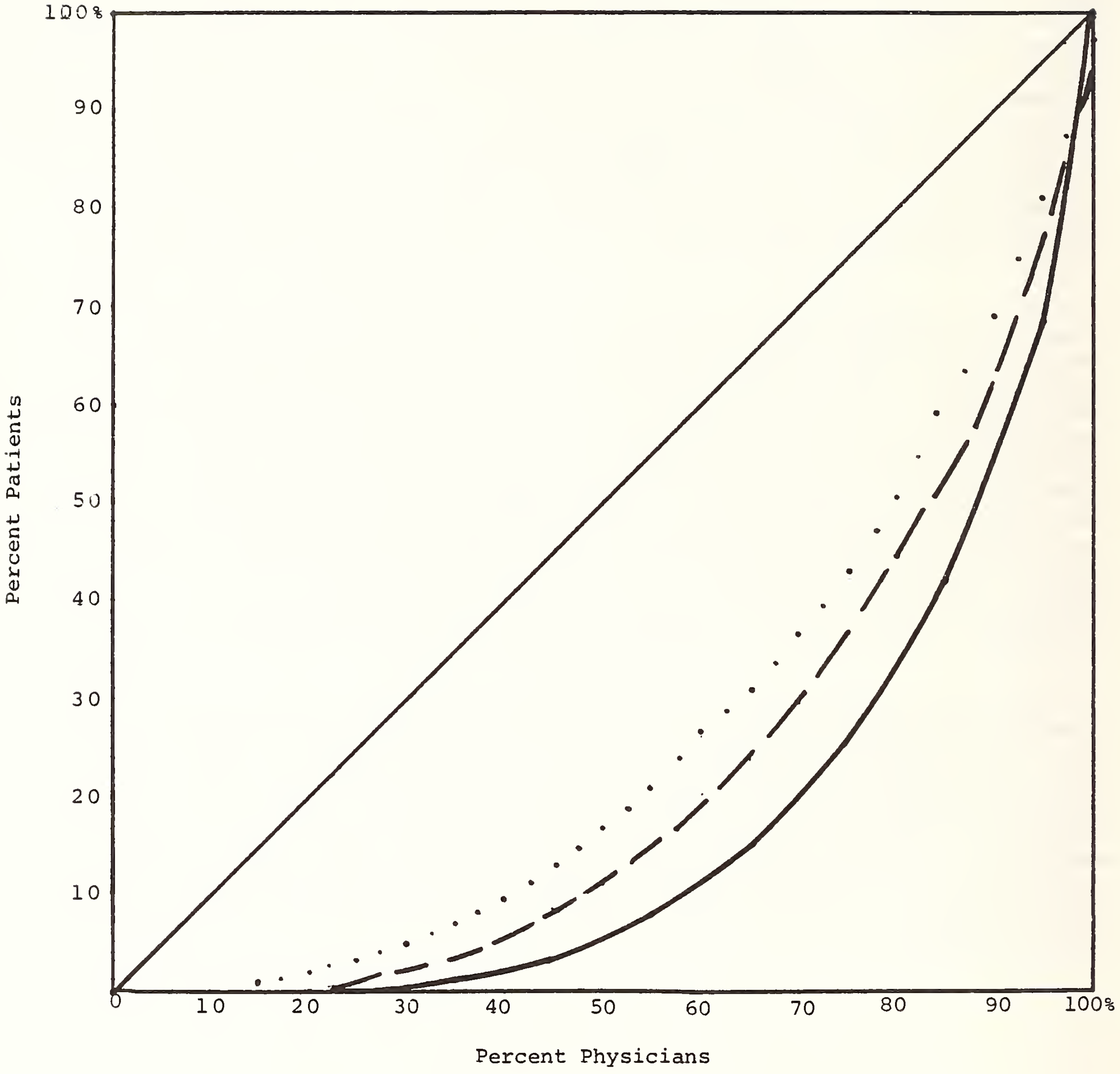

Figure V-2: LORENZ CURVE

KEY: ——— Medicaid

— — — Medicare

. . . . . . . . . Blue Shield

TABLE V-2

## SIZE DISTRIBUTION OF MEDICAID PATIENTS BY MEDICAID PRACTICE SIZE

| Medicaid Practice Size | Physicians* | Medicaid Patients |
|---|---|---|
| None | 22.5 | 0.0 |
| Small | 63.0 | 41.6 |
| Large | 10.0 | 26.6 |
| Extra-Large | 5.5 | 31.8 |
| Total | 100.0% | 100.0% |

*Due to discontinuities in the cumulation, these percentages are not strictly comparable to those in Table V-3.

## Specialty Differences in the Size Distribution of Medicaid Practices

Before analyzing the large Medicaid practices in detail, we will briefly compare the size distribution of Medicaid practices across the specialty groups. Medicaid participation rates for primary care physicians have previously been reported by Sloan, Cromwell, and Mitchell (1978). This is the first time, however, that national estimates have been available for the other specialties as well. As seen in Table V-3, participation levels vary considerably by specialty. Medicaid participation rates average 12.7 percent, ranging from 6.1 percent for allergists to 16.2 percent for otolaryngologists (ear, nose, and throat specialists).

With the notable exception of obstetrician-gynecologists (OB-GYNs)*, primary care practitioners are more likely to have large Medicaid practices than are the subspecialists. In part, this may reflect the role of primary care physicians as gatekeepers to the rest of the health care system. In addition, usual fees for primary care practitioners may be closer to the Medicaid allowed fee than those of subspecialists, thus encouraging them to see a larger number of Medicaid patients.

Both medical and surgical specialists have undergone additional years of professional training, and can (and do) command high fees for their services. Human capital theory would hypothesize that all subspecialist physicians, regardless of specialty type, would find Medicaid fee schedules relatively less attractive and hence be less likely to participate. In spite of this, the two groups differ markedly in their mean levels of Medicaid participation. Medical specialists are twice as likely as their surgical colleagues not to participate in Medicaid (32.2% vs. 15.3%), and likewise have far fewer large Medicaid practices. Surgical specialists, on the other hand, more closely resemble primary care practitioners in their average willingness to treat Medicaid patients. How can we account for this striking difference in Medicaid behavior between surgical and medical specialists? There are at least four (not mutually exclusive) explanations.

First, Medicaid fee schedules may be relatively more generous in their reimbursement of surgical procedures. Operations are discrete procedures, and relative complexity can be easily captured by such measures as the

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*The relatively small Medicaid share of OB-GYN practices is puzzling for at least two reasons. First, a large proportion of Medicaid recipients (21.2%) are women of child-bearing age, who are eligible through AFDC programs (MMMI, 1979). (The figure of 21 percent actually includes all adults in families with dependent children. Given the restrictive eligibility criteria for AFDC, however, it seems reasonable to assume that most of these are women.) Second, all other types of surgeons generally appear to have more Medicaid patients than non-surgeons (Table V-3).

TABLE V-3:

SIZE DISTRIBUTION OF MEDICAID PRACTICES BY SPECIALTY

| Specialty | Medicaid Practice Size | | | Average Participation Rate |
|---|---|---|---|---|
| | None | Small | Large | |
| Primary Care | 21.6% | 62.6% | 15.8% | 13.3% |
| General Practice | 24.3 | 60.8 | 14.9 | 13.5 |
| General Surgery | 8.4 | 75.1 | 16.5 | 14.3 |
| Internal Medicine | 18.1 | 62.5 | 19.4 | 14.5 |
| Obstetrics/ Gynecology | 36.8 | 53.3 | 9.9 | 8.3 |
| Pediatrics | 24.1 | 58.5 | 17.4 | 14.3 |
| Medical Specialties | 32.2 | 58.8 | 9.1 | 9.0 |
| Allergy | 40.0 | 55.3 | 4.7 | 6.1 |
| Cardiology | 39.2 | 55.7 | 5.1 | 6.7 |
| Dermatology | 26.1 | 56.5 | 17.4 | 13.1 |
| Gastroenterology | 15.2 | 77.9 | 6.9 | 10.0 |
| Surgical Specialties | 15.3 | 71.7 | 13.6 | 13.3 |
| Neurosurgery | 18.3 | 71.6 | 10.1 | 10.9 |
| Opthalmology | 12.4 | 72.7 | 14.9 | 14.4 |
| Orthopedic Surgery | 19.8 | 71.2 | 9.0 | 10.7 |
| Otolaryngology | 13.2 | 66.5 | 20.3 | 16.2 |
| Urology | 14.1 | 69.2 | 16.6 | 14.3 |
| Psychiatry | 39.9 | 51.7 | 8.4 | 8.0 |
| ALL | 22.6 | 62.9 | 14.5 | 12.7 |

California Relative Value Scale. As a result, reimbursement rates may be more directly tied to the level of physician effort required to perform the procedure. Non-surgical services, on the other hand, such as a diagnostic work-up during an office visit, tend to be more heterogeneous and vary considerably as a function of physician specialty and other characteristics. Cardiologists, for example, average 53 minutes per office patient, compared with 25 minutes for an internist and only 18 minutes for a general practitioner, differences that presumably reflect variations in casemix complexity. Higher allowed fees for specialists may still be insufficient to offset their longer visits, even in states which recognize some specialty differences in their Medicaid fee schedules.

Second, the relatively greater supply of surgical specialists may encourage entry into the Medicaid market through increased competition. The five surgical specialties included here constitute 13.5 percent of all office-based physicians nationwide, as compared with 5.4 percent for medical specialists (AMA, 1977). Surgical specialists are also more evenly distributed across states and across urban-rural areas than are their medical colleagues, facilitating access to their services (Morrow, 1977).

Third, surgical specialists are more likely to see patients outside their offices, in public settings such as hospitals, and more often on an emergency basis. Under these conditions, surgeons may find it more difficult to refuse acceptance of a Medicaid patient. Hospital administrators and service chiefs may also have more leverage in encouraging Medicaid participation by surgeons through control of operating room schedules and privileges.

Fourth, and perhaps most important, the demand by Medicaid beneficiaries is skewed toward children and the elderly who generate 16.6 percent and 36.7 percent of total expenditures respectively (MMMI, 1979). Three of the subspecialties with particularly high Medicaid participation rates are surgeons who treat these age-groups: (1) otolaryngologists; (2) opthalmologists; and (3) urologists. A large proportion of otolaryngologists' practice, for example, is devoted to otitis media, tonsillitis, and other common childhood diseases (NCHS, 1978c), while opthalmologists and urologists report that the elderly constitute a large proportion of their patient population (NCHS, 1978b,f). Increased demand due to casemix differences can only be a partial explanation, however; cardiologists, spend 40 percent of their office visits with patients aged 65 and older (NCHS, 1978g), but have below-average Medicaid participation rates.

Finally, psychiatrists have one of the lowest participation rates of all specialists and are among the least likely to run large Medicaid practices. This is almost certainly a direct result of state program variations in benefit levels and eligibility criteria. Federal regulations mandate only limited coverage of mental health services, and benefits are biased toward institutional services. Approximately 9.2 percent of total Medicaid expenditures went for physicians' services in fiscal year 1977 (MMMI, 1979); by contrast, physicians accounted for only 1.5 percent of Medicaid mental health expenditures in the same year (President's Commission on Mental Health, 1978).

Access by the poor to mental health services is probably not quite as restricted as these participation rates would suggest. Many Medicaid recipients undoubtedly receive care from psychiatrists and other mental health professionals in non-office settings, such as community mental health centers. Nevertheless, access to "mainstream" psychiatric care is certainly limited, relative to other types of medical care.

### Analysis Plan

Different specialists clearly vary not only in their willingness to accept Medicaid patients in general, but also in their propensity to run large Medicaid practices. In all, over fourteen percent of survey physicians have been identified as operating large Medicaid practices. Who are these physicians? Do they earn unusually high incomes? Do their practices resemble Medicaid "mills"?

Analysis of large Medicaid practices consists of two components: (1) tabular presentations, comparing physicians in large Medicaid practices with other physicians; and (2) multivariate analysis of physicians with large versus small Medicaid practices. The tables provide descriptive data for three groups of physicians: (1) large Medicaid practices; (2) small Medicaid practices and (3) those with no Medicaid patients. For primary care physicians, large Medicaid practices are decomposed into LMPs (30-50% Medicaid), ELMPs (>50% Medicaid), and HILMPs (LMPs and ELMPs with net incomes greater than $80,000).

Comparisons and statistical tests of LMPs will clearly vary as a function of the physician group used as a reference point. Does it really matter whether we compare LMPs with SMPs or with no-Medicaid practices? For policy purposes, the answer is yes. By the very fact of their nonparticipation, physicians with no Medicaid patients are a unique group; they are a small group relative to SMP physicians and they tend to be older and politically more conservative (Sloan, Cromwell, Mitchell, 1978). Physicians with small Medicaid practices, on the other hand, can be considered a modal form of medical practice and one that policymakers want to encourage. In both descriptive and multivariate analyses, LMP physicians (and those with extra-large Medicaid practices) will be contrasted with SMP physicians.

The following Chapter (VI) presents descriptive findings for the primary care practitioners along such dimensions as net incomes, physician credentials, work effort and caseload, gross revenues, costs, and mark-ups. In Chapter VII, two sets of multivariate analyses are presented. First, discriminant analysis is used to identify LMPs with Medicaid mill characteristics. Second, probit analysis is used to assess the probability of an SMP becomming an LMP, particularly with reference to policy variables, such as Medicaid fee schedules. Separate regression equations are estimated, using alternative definitions of LMP, and their coefficients compared. The HILMPs (LMP physicians netting at least $80,000 per year) are analyzed in Chapter VIII. Chapter IX presents descriptive findings for the three subspecialty groups.

Throughout this report, particular emphasis has been placed on primary care physicians. First, this group constitutes 63.5 percent of all sample physicians (and over one-half of office-based patient care physicians nationwide). Second, primary care physicians provide access to ambulatory medical care, the area of greatest concern to federal policymakers. Finally, it is these practitioners who have been most frequently identified as running "Medicail mills". Limited analysis of the medical and surgical specialists is provided primarily for comparative purposes with the primary care physicians.

## VI. DESCRIPTIVE ANALYSIS OF PRIMARY CARE PHYSICIANS

### Practice Location

Large Medicaid practices are often considered an urban phenomenon. One has the image of a densely populated, inner city population, poor and out-of-work, being served either in store front offices by overworked physicians or in hospital emergency rooms and outpatient clinics. This image, however, does not square with the facts. Table VI-1 displays the size of Medicaid practice by geographic location: large (greater than 1.4 million), small, and non-metropolitan area, high and low Medicaid population. Both SMPs and LMPs exhibit the same distribution across large and small metropolitan areas (see percentages to the left of the /) while ELMPs are actually more prevalent in small metropolitan areas. ELMPs, therefore, are more likely than SMPs to be in small cities, which is certainly unexpected. Note, too, that nearly one out of every five LMPs and ELMPs are located in non-metropolitan, or rural areas. Much of the rural population is very poor, a fact often overlooked because of the greater visibility of the urban poor. Might these small metropolitan and rural LMPs be quite different in practice style and motivation from their big city counterparts? Are different forces at work "creating" LMPs in different areas? These are provocative questions only partially addressed by our study.

Another unexpected result is the higher percentage of nonparticipants located in large metropolitan areas. Why do relatively more physicians refuse to participate in large urban versus rural areas? Is it because private demand (higher incomes, better insurance) competes more successfully for physicians' time in large cities? Or is it the small relative size of the Medicaid pool; small that is, in terms of the number of Medicaid eligibles per physician, that discourages participation? Almost 40 percent of all nonparticipants reside in large metropolitan, low Medicaid areas which does suggest a small pool to draw from. Another 10 percent of nonparticipants reside in large, high Medicaid cities, suggesting competing demand factors restrict participation as well.

The size distribution of Medicaid practices is quite similar within metropolitan and non-metropolitan areas, with the exception of the higher overall participation rate in rural areas (see percentages to the right of the /). Large cities, small cities, and rural areas have about the same percentage of LMPs and ELMPs while rural areas have a relatively larger percentage of physicians operating SMPs (69.8%) because of greater average participation. Small Medicaid populations limit the number of ELMPs in any area which makes theoretical sense. One interesting contrast can also be made between high Medicaid, small and non-metropolitan areas. Both exhibit very high physician participation rates, yet very different percentages of LMPs. This may be due to physician shortages in rural areas increasing the Medicaid pool per physician. On the other hand, physicians may be more productive in rural areas, working longer hours and seeing more patients.

Turning to region of the country, we find that most LMPs are not located in the large industrial cities in the north, but rather in the South and West. The ELMPs, however, are primarily located in the Northeast, as expected. Nonparticipation is greater in the South which is also consistent with what we know about political ideology. Intraregional variations in the size distribution of Medicaid practices are also pronounced

TABLE VI-1:

## GEOGRAPHIC LOCATION BY SIZE OF MEDICAID PRACTICE[a]
(percentage distributions)

| Location / Medicaid Practice Size | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| Large Metropolitan: | 49.0/25.9 | 37.8/59.4 | 39.3/10.7 | 32.2/4.0 |
| High Medicaid | 10.1/32.3 | 5.1/48.1 | 5.6/ 9.0 | 13.9/10.6 |
| Low Medicaid | 38.9/24.6 | 32.7/61.7 | 33.7/11.0 | 18.3/ 2.7 |
| Small Metropolitan: | 36.0/19.9 | 38.1/62.8 | 38.5/11.0 | 48.7/6.4 |
| High Medicaid | 1.6/ 7.3 | 5.3/70.2 | 4.8/10.8 | 11.3/11.7 |
| Low Medicaid | 34.4/21.6 | 32.8/61.7 | 33.7/11.0 | 37.4/ 5.6 |
| Non-Metropolitan: | 15.2/14.9 | 24.0/69.8 | 22.1/11.0 | 19.1/ 4.3 |
| High Medicaid | 1.6/ 8.5 | 4.2/62.4 | 8.8/22.5 | 6.1/ 6.7 |
| Low Medicaid | 13.6/16.4 | 19.8/71.6 | 13.3/ 8.2 | 13.0/ 3.8 |
| Region: | | | | |
| North East | 27.7/21.4 | 29.3/65.5 | 9.2/ 3.6 | 54.0/ 9.6 |
| North Central | 21.2/21.5 | 23.3/68.3 | 16.4/ 8.3 | 8.2/ 1.9 |
| South | 38.2/27.7 | 27.5/57.7 | 31.4/11.7 | 19.7/ 3.3 |
| West | 12.8/13.4 | 19.9/59.9 | 42.9/22.3 | 18.2/ 4.3 |

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[a] Percentages to the left of the slash (/) sum to 100% within each column. Percentages to the right sum by row.

(see the numbers on the right of the /). The Northeast and North Central regions have the same distribution of nonparticipants and SMPs, but drastically different LMP compositions. Most of the large Medicaid practices in the Northeast are ELMPs while LMPs dominate in the North Central region. Is this due to a larger more concentrated geographic distribution of Medicaid eligibles in the Northeast, or to a greater variation in supply characteristics (e.g., productivity, work effort, practice style)? These are questions still to be answered.

The South and West pose different questions. Each vary significantly in their nonparticipation rates (28 percent in the South vs. only 13 percent in the West), yet both show the same percentage of SMPs. The difference comes primarily in the number of LMPs which is much lower in the South. This could be due simply to a difference in private demand, which if greater in the South (per physician), would explain the higher nonparticipation rates, with the depleted ranks of SMPs being filled by LMPs who now see more private patients. Granted, incomes and insurance are both lower in the South, but so are physicians per capita (1.38 vs. 1.79 per 1,000 population in the West); therefore it is conceivable Southern physicians can more easily fill their caseloads with private patients. Lower Medicaid fees or greater discrimination in the South, on the other hand, could give similar results. Only a multivariate analysis holding all factors constant can separate out the possible hypotheses.

## Physician Incomes

One of the biggest concerns of policy makers is the incomes enjoyed by physicians in LMPs. The presumption is that many are making extraordinary incomes, feeding off the public largesse. There is little, if any, solid evidence to support such claims, on the other hand. In this section we present nationally representative data on incomes earned in LMPs versus other kinds of practices which shed light on these claims.

Table VI-2 reports physician net incomes by Medicaid practice size by primary care specialty, adjusted for regional cost of living differences. Hence, both specialty mix and geographic location are held constant in comparing incomes. No salient pattern exists as Medicaid participation increases. Surgeons, internists, and OB-GYNs do earn more in LMPs, but general practitioners and pediatricians earn less. And except for OB-GYNs, physicians in ELMPs earn significantly less than their colleagues in SMPs. The overall mean income of ELMP physicians was $13,000 per year less than those in SMPs. Net incomes in LMPs were higher, but only by an insignificant $1,000* Non-participating physicians earn less than either those in SMPs or LMPs, suggesting that the higher fees they might charge private patients are more than offset by lower workloads. Evidence presented later bears this out (see, in particular Tables VI-6,9,10).

Yes, but what about the outliers? How many LMPs and ELMPs enjoy extraordinary incomes? Table VI-3 presents income size distributions, again by specialty, for SMPs and LMPs. (ELMPs have been merged with LMPs because of

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*The cost-of-living adjustment raised the overall mean income of the sample by over $2,700 ($57,835 vs. $55,111 unadjusted), but had no significant effect on relative incomes across the groups.

TABLE VI-2:

### PHYSICIAN NET INCOMES[a] BY SIZE OF MEDICAID PRACTICE

| Medicaid Practice Size<br>Specialty | Total | None | Small | Large | Extra-Large |
|---|---|---|---|---|---|
| General Practitioner | $53,531 | $51,413 | $56,841 | $53,111 | $44,447*** |
| General Surgeon | 66,507 | 43,967 | 68,793 | 72,209 | 43,283** |
| Internist | 58,239 | 47,454 | 60,285 | 62,740 | 51,353* |
| OB-GYN | 64,560 | 60,419 | 66,699 | 71,784 | 68,650 |
| Pediatrician | 51,139 | 52,531 | 50,825 | 47,213 | 52,679 |
| All | 57,835<br>(55,111) | 52,100<br>(49,462) | 60,572<br>(57,712) | 61,571<br>(58,110) | 47,089***<br>(46,078) |

***Significant at .01 confidence level (2-tail test)
**Significant at .05 confidence level
*Significant at .10 confidence level

[a] Adjusted for cost-of-living. Unadjusted net incomes by Medicaid practice size appear in parentheses.

TABLE VI-3:

## SIZE DISTRIBUTION OF PHYSICIAN INCOMES, SMALL AND LARGE MEDICAID PRACTICES

### Large Medicaid Practices

| Income Category | General Practitioners | General Surgeons | Internists | OB-GYNs | Pediatricians |
|---|---|---|---|---|---|
| $20,000 or less | 3% | 7% | 4% | 3% | 3% |
| $20,000-40,000 | 17 | 12 | 14 | 7 | 23 |
| $40,000-50,000 | 41 | 13 | 2 | 6 | 28 |
| $50,000-60,000 | 25 | 4 | 27 | 5 | 33 |
| $60,000-70,000 | 3 | 5 | 31 | 8 | 2 |
| $70,000-80,000 | 5 | 23 | 2 | 51 | 2 |
| $80,000-90,000 | 3 | 28 | 8 | 13 | 0 |
| $90,000-100,000 | 0 | 0 | 0 | 4 | 9 |
| $100,000-125,000 | 2 | 6 | 11 | 2 | 0 |
| $125,000- + | 1 | 2 | 1 | 1 | 0 |
| Total | 100% | 100% | 100% | 100% | 100% |

### Small Medicaid Practices

| Income Category | General Practitioners | General Surgeons | Internists | OB-GYNs | Pediatricians |
|---|---|---|---|---|---|
| $20,000 or less | 6% | 1% | 1% | 3% | 6% |
| $20,000-40,000 | 15 | 10 | 9 | 12 | 20 |
| $40,000-50,000 | 16 | 9 | 17 | 9 | 21 |
| $50,000-60,000 | 27 | 12 | 22 | 14 | 26 |
| $60,000-70,000 | 18 | 28 | 31 | 21 | 11 |
| $70,000-80,000 | 2 | 12 | 10 | 17 | 5 |
| $80,000-90,000 | 9 | 8 | 3 | 8 | 8 |
| $90,000-100,000 | 4 | 9 | 5 | 5 | 1 |
| $100,000-125,000 | 1 | 10 | 1 | 8 | 2 |
| $125,000- + | 2 | 1 | 1 | 3 | 0 |
| Total | 100% | 100% | 100% | 100% | 100% |

small sample sizes). Except for internists, where 20 percent in LMPs enjoy incomes in excess of $80,000 vs. only 10 percent in SMPs, the size distributions show no unexpectedly large number of high income LMPs. In fact, a decidedly smaller percentage of general practitioners enjoy high incomes in LMPs (6 percent vs. 16 percent in SMPs), which explains their significantly lower mean income compared to their counterparts in SMPs. Still, the fact that 36 percent of surgeons, 20 percent of internists, and 20 percent of OB-GYNs earn over $80,000 in practices serving large numbers of low-paying Medicaid patients is interesting. Are these the Medicaid mills Senator Moss has investigated? We return to this provocative question in Chapter VIII.

Variations in net incomes are open to interpretation depending on the underlying source of variation. Net incomes (Y) can be decomposed as:

$$(1) \qquad Y = \left[\frac{GR}{V} - \frac{C}{V}\right] \cdot \frac{V}{MH} \cdot MH$$

where GR/V = gross revenues per visits, C/V = average cost per visit, V/MH = visits per physician hour, and MH = total physician hours. Net incomes in some large Medicaid practices could be higher than elsewhere because (a) gross incomes per visit are higher, (b) average costs were lower, (c) physician time with the patient is shorter, or (d) work effort is greater. We have already shown that LMP physicians as a whole do not earn significantly higher incomes and that ELMP physicians actually earn significantly less. Yet, if these incomes were achieved through a disproportionately lower work effort, the reported incomes may, in fact, be excessive.

Table VI-4 presents physician net incomes adjusted for both cost-of-living and hours worked. The result is an imputed real wage which stands as a rough measure of the physician's economic return to labor.* Adjusting income for work effort does not alter the overall conclusion that LMP and ELMP physician as a whole are not enjoying extraordinary returns. If anything, hourly earnings are lower in practices serving large numbers of Medicaid patients. This is particularly true of general practitioners in LMPs

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*Wages imputed from reported earnings and hours worked information of self-employed entrepreneurs invariably include a return to capital as well. That is, reported practice earnings will usually include a return to physician effort plus some (unknown) return to the other inputs (e.g., medical equipment, space). A physician working an hour in a capital-intensive practice is likely to be much more productive. If he were salaried, his wage would theoretically include only his marginal contribution to output. As a self-employed entrepreneur, he naturally appropriates both the return to his own labor plus that flowing to the other inputs owned by the practice. Thus the data presented in Table VI-4 are not returns to labor strictly speaking, but something more. While one could argue that extraordinary earnings/hours-worked ratios may be due to returns to entrepreneurship rather than labor, and hence are efficient, equity concerns remain. For another discussion of this point, see Sloan (1974).

TABLE VI-4:

## IMPUTED PHYSICIAN HOURLY WAGES[a] BY SIZE OF MEDICAID PRACTICE

| Specialty \ Medicaid Practice Size | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| General Practitioner | $23.45 | $22.22 | $18.29** | $15.86*** |
| General Surgeon | 20.11 | 27.78 | 29.23 | 17.23** |
| Internist | 23.29 | 24.50 | 24.57 | 23.58 |
| OB-GYN | 26.82 | 27.27 | 27.89 | 24.02 |
| Pediatrician | 21.67 | 22.69 | 19.35 | 22.27 |
| All | 23.69 | 24.40 | 23.63 | 18.22*** |

[a] Adjusted for cost-of-living

whose earnings per hour are nearly four dollars less than those in SMPs. Internists in ELMPs are the sole exception: adjusting for hours worked completely eliminates any difference in incomes vis-a-vis SMP internists which appeared in the net income table (Table VI-2).

Even though LMP and ELMP physicians report incomes and earnings per hour no higher than in other practices and often lower, one could still argue that these hourly earnings are unjustified given their background and training. This argument is taken up in the next section on physician credentials.

Any residual income difference in net incomes once work effort is accounted for would have to be explained by variations in the other three components, variations which may or may not be efficient and equitable. Taking each in turn, gross revenues per visit can be considered as the weighted average of visit and ancillary fees from Medicaid and non-Medicaid patients:

$$(2) \qquad \frac{GR}{V} = \left[f_{vo} + f_{ao} \cdot \frac{ANC_o}{V_o}\right] \cdot \frac{V_o}{V} + \left[f_m + f_{am} \cdot \frac{ANC_m}{V_m}\right] \cdot \frac{V_m}{V} ,$$

where $f_{vo}$, $f_{vm}$ = average visit fees for non-Medicaid and Medicaid patients, respectively, $f_{ao}$, $f_{am}$ = average ancillary fees, $ANC_o / V_o$, $ANC_m / V_m$ = average number of ancillaries per visit, and $V_o$, $V_m$ = total non-Medicaid and Medicaid visits. Medicaid visit fees are generally not the focus of criticism of large Medicaid practices, as fees tend to be considerably below those of other insurors.* Rather the concern has been more with unnecessary ancillary utilization, or $ANC_m / V_m$. Both visit and ancillary fees are rigidly set under state Medicaid programs but not ancillary utilization. This is left to individual physician discretion. One of the alleged characteristics of Medicaid mills is the excessive use of ancillary laboratory tests, injections, and x-rays. The legitimacy of this claim will be examined in a later section.

Besides looking at ancillary revenues, we also include an analysis of physician gross markups per visit, ( $\frac{GR}{V} - \frac{C}{V}$ ) including revenues from all practice sources and nonphysician costs. Ceteris paribus. mark-ups should be lower in LMPs because Medicaid fees are lower, but this does not necessarily have to be the case if LMP physicians are (a) charging higher fees to non-Medicaid patients, (b) generating unnecessary, but highly profitable, ancillary services, or (c) keeping costs per visit low. High markups do not necessarily mean malfeasance, but may suggest undesirable behavior of one type or another.

Another criticism of large Medicaid practices is that they skimp on inputs -- particularly medical inputs -- in an effort to cut average costs and increase profits for a given revenue base. This claim will also be examined by decomposing the labor mix of physician practices by extent of Medicaid participation.

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*In 1976, primary care physicians reported the following fees for a routine office follow-up visit after hospitalization: $11.59 (usual); $9.22 (Blue Shield); $8.79 (Medicare); and $7.20 (Medicaid), (Sloan, Mitchell, Cromwell (1978)). Many states also limit the number of visits reimburseable under Medicaid (MMMI,1979).

Finally, there is the claim that physicians in Medicaid mills shortchange patients by spending less time with them in their office. By seeing six patients an hour instead of five, the physician can increase his/her net income per hour worked, and because Medicaid patients do not pay for the care they receive, they have little financial incentive to demand longer visits. Many may also feel they have little right to demand more time.

Simple comparisons of costs and visit lengths across large and small Medicaid practices can be misleading however, for several reasons. First, patient casemix may be different, even within specialty, confounding the issue of productivity with appropriateness. Small and large Medicaid practices may have similar visit lengths, but once casemix is held constant, LMPs may exhibit shorter visit times. Second, physicians vary in their work intensity. A physician seeing six patients an hour may provide as much or more medical care as one seeing only five. Physicians may also vary in productivity due to their willingness to delegate tasks to auxillary personnel, e.g., RNs, secretaries, clerks. Thus, simple measures like visits per physician hour, while they can suggest basic differences in the nature of care being delivered under certain circumstances, must be interpreted with caution. Excluding medical and surgical specialists from the sample and presenting the results by primary care specialty partially adjusts for casemix, but some residual difference undoubtedly remains.

### Physician Credentials

Physicians with large Medicaid practices have been characterized as having fewer credentials on average than other physicians. In particular, LMPs are thought to be disproportionately operated by older physicians, nonspecialists, non-board-certified physicians, foreign medical graduates, and by physicians lacking hospital affiliations. To the extent that these physicians have less or inadequate training, Medicaid recipients in their practices may be receiving lower quality care. Lack of specialty training or board-certification does not necessarily imply poor care; there are many general practitioners and non-certified specialists who are excellent primary care physicians. If LMPs were to be dominated by such physicians, however, policymakers would be concerned over a possible lack of access by the poor to more specialized services.

Table VI-5 compares physician credentials across the Medicaid practice size. General practitioners dominate the extra-large Medicaid practices; almost three-fifths of physicians in these practices (59.2%) are general practitioners, as compared with only 39.9 percent of the SMPs. By contrast, the LMPs include a significantly lower proportion of general practitioners (29.3%) and a significantly higher proportion of internists (30.5%) than do SMPs (39.9% and 20.9%, respectively). Despite the higher proportion of specialists in large Medicaid practices, LMP physicians are significantly less likely than those in SMPs to be board-certified in their specialty. The extra-large Medicaid practices include very few board-certified physicians (15.9%), due in part to the preval-

TABLE VI-5:

## SPECIALTY AND PHYSICIAN CREDENTIALS BY SIZE OF MEDICAID PRACTICE

| Credential \ Medicaid Practice Size | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| Specialty: | | | | |
| General Practitioner | 46.0 | 39.9 | 29.3*** | 59.2*** |
| General Surgeon | 6.9 | 21.2 | 22.3 | 10.1*** |
| Internist | 17.5 | 20.9 | 30.5*** | 15.4 |
| OB-GYN | 19.8 | 9.9 | 9.4 | 2.7*** |
| Pediatrician | 9.8 | 8.2 | 8.4 | 12.5 |
| Total | 100.0% | 100.0% | 100.0% | 100.0% |
| Board Certification | 31.3 | 42.8 | 32.1*** | 15.9*** |
| Foreign Medical Graduate (FMG) | 10.9 | 12.2 | 24.4*** | 12.1 |
| Third World FMG | 6.5 | 4.8 | 14.5*** | 2.3 |
| Sixty Years or Older | 41.5 | 28.8 | 31.6 | 46.1*** |
| No Hospital Affiliation | 5.2 | 1.5 | 1.8 | 5.0* |

ence of general practitioners in this practice size.*

Large Medicaid practice physicians have been frequently characterized as foreign medical graduates (FMGs). FMGs are commonly believed to have received less adequate training (although the empirical evidence is ambiguous), and thus the care they provide to Medicaid patients may be of lower quality. As some foreign medical schools are generally believed to have better curricula than others, we also distinguish Third World FMGs from other FMGs. The Third World FMG is defined here as a graduate of a non-Western European, non-English speaking country. (Graduates from Mexican medical schools are excluded, as many are American citizens.) Twice as many FMGs are found in LMPs than in SMPs; one out of every five physicians with a large Medicaid practice was trained outside the U.S. Using the more restrictive definition of the Third World FMGs, LMPs include three times as many FMGs, 14.5 percent versus 4.8 percent. Surprisingly, the extra-large Medicaid practices do not include any more FMGs, however defined, than do the SMPs. The expected relationship between FMG status and size of Medicaid practice holds true only for those practices 30-50 percent Medicaid.

Some policymakers have expressed concern that large Medicaid practice physicians are older and that this may endanger the quality of care, not because these physicians are incompetent, but because they have not been trained in the newer medical technology. Similarly, physicians without hospital affiliations may provide less up-to-date care if they are unable to admit their own patients to the hospital for care. If hospitalization is required, they must rely on a specialist who both has admitting privileges and is willing to accept Medicaid patients, or they must send their patients to the emergency room. Continuity of care is clearly impossible under these circumstances, and quality may also suffer. Only ELMP physicians appear to fit the characterization; they are significantly more likely to be sixty years of age or older, and less likely to be affiliated with a hospital. ELMP physicians closely resemble the nonparticipants in these respects. The ELMP group may include many of the aging general practitioners described earlier, those who, due to geographic immobility, found themselves running large Medicaid practices by default rather than by design. Another older, less specialized group may not participate in Medicaid because they are politically conservative, because they are located outside poor areas, or because poor health has forced them to reduce their workloads.

In sum, the LMP and ELMP physicians do have fewer credentials on average than do SMP physicians, but these differences are not monotonic with respect to size of Medicaid practice. Physicians with large Medicaid practices tend to be younger, more specialized FMGs, while those with extra-large Medicaid practices are older domestic physicians in general practice, without hospital affiliations. Physicians in both groups are less likely to be board-certified, compared with SMPs.

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*General practice and the absence of board-certification are not synonomous. The category, general practice, also includes family practice, which does involve additional training and board examinations.

## Imputed Hourly Earnings and Physician Credentials

In the previous section we introduced the possibility that LMP physicians may be enjoying incomes that, if not excessive compared to other physicians, were relatively high given their background and training. To test this hypothesis, adjusted hourly earnings of all primary care physicians were regressed on the list of physician credentials (including age) and other exogenous variables that might affect returns to labor.* The latter include: percent of population over 65 (a proxy for Medicare coverage and health status); county per capita income, cost-of-living adjusted (a demand proxy); an index of mortality (a proxy for need); the physician-population ratio (a measure of physician competition and individual demand); a dummy for whether the physician was salaried or self-employed (a partial adjustment for non-labor returns); and dummy variables for specialty (measures of demand and return to additional training). Residuals from this regression should reflect returns over-and-above those attributable either to the background and training of the physician or to location choice.

Two analyses of variance on the residuals were performed, one each contrasting LMPs and ELMPs with SMPs. Both the LMP and ELMP residuals were negative, implying average hourly earnings less than might be expected given credentials and other economic factors. Residuals for SMP physicians were not significantly different from zero, and F-tests of the differences in residuals between LMPs or ELMPs, and SMPs were highly significant (less than one percent in each case).

Holding both credentials and economic factors constant, there is no evidence that LMP or ELMP physicians as a group earn extraordinary earnings. In fact, just the opposite is the case: physicians with Medicaid-dominated practices earn significantly less per hour worked than their peers who see a smaller number of Medicaid patients, ceteris paribus. This finding is consistent with the theory of LMPs presented in Chapter Three in which older, less skilled, or altruistic physicians serving Medicaid patients receive lower fees, both from Medicaid and their private practice generally. The results also imply that Medicaid mills are, at best, only a small proportion of all LMPs. That they exist at all, however, is a matter of legitimate concern, a point we return to in Chapter VIII, when we examine high income LMPs. There, evidence is presented that suggests not all LMP physicians financially suffer in their decision to see large numbers of Medicaid patients.

### Caseload and Work Effort

Physician caseloads have been a major concern regarding large Medicaid practices for two reasons. First, relatively high volume in these practices suggests that many Medicaid visits may be of marginal benefit or even unnecessary. Any such inducement by physicians will clearly drive up Medicaid expenditures. Second, high volume in LMPs may be achieved through shorter physician contacts, thus lowering quality of care for Medicaid recipients.

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* This list was drawn from Sloan (1974). For a theoretical discussion of the hours worked equation, the reader is referred to his work.

Physicians in both LMPs and ELMPs make significantly more visits *in toto* than do those in SMPs, approximately 10 percent more on average (Table VI-6). (Total visits represent the mean sum of the six visit categories.) The major sources of this variation are office visits and emergency room/clinic visits. Office caseloads are particularly high in the extra-large Medicaid practices: 130.5 versus 102.8 SMP visits per week (a 27 percent difference). As *total* volume does not not vary between LMPs and ELMPs, the disproportionately high ELMP office caseload must be offset by reduced visit levels in other areas. The ELMPs are in fact less hospital-based; these physicians perform fewer operations and make fewer inpatient visits than either SMP or LMP physicians, which is consistent with the non-specialized orientation of the group. Why LMPs are performing more operations is puzzling, however, as there are no specialty differences that would readily account for this. Demand-shift is one possible explanation, i.e., LMP physicians using their discretionary ability to recommend (and perform) marginally useful surgical procedures. An alternative explanation is that Medicaid patients are sicker and hence more likely to require surgical intervention. Without more information on illness patterns of Medicaid and non-Medicaid patients, it is impossible to reject either hypothesis.

A major policy concern has been that substantial physician nonparticipation in Medicaid would encourage utilization of institutional sources of ambulatory care, i.e., emergency rooms and outpatient clinics. It is thus disturbing to observe that the high LMP and ELMP caseloads are due in part to increased volume in precisely those areas. Physicians with large and extra-large Medicaid practices supply 55 percent more patient visits in emergency rooms and clinics than do SMP physicians. It is unlikely that many of these visits are provided to private (the physician's own) patients. Instead, these physicians may work part-time in a hospital emergency room and/or clinic under a contractual agreement with the *institution*. Medical school faculty typically provide at least some patient care in this manner. Given their general lack of credentials, however, LMP and ELMP physicians probably do not have medical school appointments. More likely, their hospital outpatient activities simply provide a supplemental source of income. Nevertheless, emergency room/clinic visits constitute a relatively small proportion of total visits;, LMP and ELMP physicians still provide considerable *office-based* care to their own Medicaid patients, increasing access to noninstitutional mainstream physician care.

Finally, physicians with large Medicaid practices make significantly more visits to nursing home patients, a population generally noted for its lack of physician services (Moss and Halamandris, 1977). As almost one-half of nursing home residents are covered by Medicaid (NCHS, 1976), we would expect a positive correlation between Medicaid participation levels and nursing home visits, *ceteris paribus*. There is no difference in nursing home volume, however, between the extra-large Medicaid practices and the SMPs (or nonparticipants, for that matter). In part, this may simply reflect casemix difference, as internists, who operate a disproportionate share of the LMPs, also are more likely to make nursing home visits (Mitchell, 1979).

TABLE VI-6:

## CASELOAD AND WORK EFFORT
## BY SIZE OF MEDICAID PRACTICE

| Medicaid Practice Size / Work Effort (per week) | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| Length of Office Visit (minutes) | 22.0 | 19.6 | 17.8*** | 19.7 |
| Total Patient Care Hours | 47.2 | 51.5 | 52.6 | 51.3 |
| Total Visits | 157.1 | 169.3 | 188.1** | 185.9** |
| Office Visits | 110.4 | 102.8 | 112.9** | 130.5*** |
| Inpatient Visits | 40.6 | 49.2 | 51.4 | 35.6*** |
| Operations | 2.3 | 3.2 | 3.8* | 1.7*** |
| Emergency Room/ Clinic Visits | 4.5 | 9.3 | 14.4*** | 14.5*** |
| Nursing Home Visits | 3.3 | 2.6 | 4.6*** | 3.1 |
| House Calls | 1.6 | 1.1 | 0.9 | 1.1 |

LMP and ELMP physicians clearly have higher caseloads, as predicted by the theory of Medicaid participation discussed in Chapter Three. For policy purposes, however, this might not matter if they also worked longer hours. In fact, as seen in Table VI-6, there are no differences in total hours by size of Medicaid practice. This finding raises concern about the pace of office visits in large Medicaid practices. Are patients hurried through the physician's office on an assembly line basis? Table VI-6 suggests they are not. Physicians in large Medicaid practices do spend significantly less time with office patients, but the differences are trivial; office visits are only two minutes shorter on average. Furthermore, the length of visit in extra-large Medicaid practices is no different than in SMPs.

In sum, physicians in large and extra-large Medicaid practices do have heavier caseloads, but do not work any harder than SMP physicians. This difference in practice style apparently has little effect, however, on the quality of patient care delivered in the office, as measured by length of visit. A large proportion of the variance in total caseloads can be attributed to higher visit rates by LMP and ELMP physicians in non-office settings, such as nursing homes and hospital outpatient clinics.

## Gross Revenues, Costs, and Markups

Besides the natural concern over the quality and continuity of care afforded Medicaid patients in LMPs, there is a general feeling, expressed in Congressional testimony and elsewhere, that significant numbers of LMP physicians are abusing the system, getting rich while short-changing patients in terms of services. If this is the case, it is not reflected in physician net incomes as we have already shown: LMP physicians' incomes at best only average SMP incomes, and usually they are less (although a few LMP physicians enjoy very high incomes). Even after adjusting for hours worked, credentials, and exogenous economic conditions, LMP physicians do not make more than SMP physicians. But what if physicians as a whole engaged in target income behavior, setting fees, incurring costs, and seeing patients so as to achieve an income comparable to their peers? Then we would not expect any great differences in incomes between LMP and other physicians. Of course, if they were able to achieve such incomes without working harder, and lacking the training of their peers, this would be telling, but that does not generally seem to be the case.

There is another way physicians are commonly alleged to abuse the system, however, and this is through excessive markups over costs. They are supposedly able to do this by taking advantage of consumer ignorance and lack of market competition. Markups are very high in all private physician practices (on the order of 150 percent), but markups and profits are not identical for self-employed entrepreneurs. Physician markups include a return to labor while profits, strictly speaking, include only a return to managerial and equity input. Stockholders in other industries enjoy much lower returns primarily because they contribute a relatively small part (i.e., capital) to the overall operation of the firm.

What is of concern here is not whether physician markups are high, but rather whether those charged by LMP physicians are unusual. A crude estimate of expected markups can be had immediately using a simple relationship between incomes ($\pi$) markups (M) and visits (V):):

$$\frac{M_{LMP}}{M_{SMP}} = \frac{\pi_{LMP}}{\pi_{SMP}} \cdot \frac{V_{SMP}}{V_{LMP}} \tag{3}$$

If LMPs and SMPs saw the same number of patients per week, markups would vary proportionately with incomes. Because LMPs report seeing 10 percent more patients (187 vs. 170 in SMPs), relative markups in LMPs vs. SMPs should average only 90 percent of relative differences in income. If incomes in LMPs and SMPs were the same, then, given the difference in volumes, relative markups would be 10 percent lower in LMPs. In instances where LMP incomes were lower, markups would be even less, holding visits constant. Any abuse that may be occurring clearly does not manifest itself either in incomes or in markups: LMP physicians are earning the same or lower incomes on average even though they are seeing more patients, two facts which necessarily imply lower markups.

Lower markups in LMPs, on the other hand, are not surprising given the relatively large number of low-paying Medicaid patients. One might ask whether LMP markups derived from reported income and volume statistics are consistent with what one would expect from the disproportionate number of Medicaid patients in their practices? If they are not, then either the income or volume figures used to derive markup estimates may be biased. Even more important, what is the composition of these markups? Are LMP markups lower because average fees are lower, bad debts are greater, markups on ancillaries are less, or average costs are lower? In this section we decompose markups into three components, revenues, costs, and fees, to determine the source of the variation in LMP, SMP markups.

Markups in the usual sense of the word measure the extent to which prices exceed average costs. Physician practices, as in most businesses, provide a number of services, each with its own markup. The unusual thing about a physician's practice is that markups generally will include a return to physician effort which is left out of accounting costs. Lack of individual fee and volume data makes it impossible to distinguish markups on every service; the best we can do is use some measure of gross billings per visit to approximate average prices (supplemented by some specific fee/data). (Cost per service presents similar kinds of problems, requiring a more aggregative approach as well.) Furthermore, physician billings will exceed gross revenues by an amount equal to bad debts. Losses should be subtracted from billings to arrive at a more meaningful transactions price.

On the cost side there is the question of how pensions and officers' compensation in incorporated practices are to be treated. If physicians in one type of practice choose to take part of their income in the form of wages, or defer it to some future period, then ceteris paribus practice costs will be higher and markups lower. Unless these costs involve unique returns to physician labor not incurred in other kinds of practices (e.g., more time administering a large practice), including them will introduce error into our estimates of markups and possibly bias the results. Pensions and officers' compensation are generally regarded as advantages to incorporation rather than payments for effort not incurred in unincorporated practices so it seems reasonable to exclude them from costs in calculating markups. This way, markups will provide a measure of the net (before tax) return to physicians of an average patient visit and will include both a return to physician labor and entrepreneurship.* If high LMP gross revenues are being offset by high pensions and officers' compensation resulting in arbitrarily low markups, decomposing markups into revenues and costs should bear this out.

Table VI-7 presents gross revenues, costs, and net revenues (or markups) per visit for the five primary care specialties by extent of Medicaid participation. Both gross revenues per visit and markups fall as extent of Medicaid participation increases. Excluding high income LMPs, LMP markups are only 82 percent of SMP markups ($9.12/$11.19), LMP markups only 58 percent as much ($6.51/$11.19). Including HILMPs, the average LMP/SMP markup ratio is 86 percent. LMP markups as a whole are lower primarily

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*An alternative way of figuring markups would have been to include an imputed value to physician input as a practice cost. Differences in talents and training make such an approach less attractive although it would be preferable in certain instances.

TABLE VI-7:

## GROSS REVENUES, COSTS, AND MARKUPS PER VISIT BY SPECIALTY BY SIZE OF MEDICAID PRACTICE

| Medicaid Practice Size<br>Specialty/Income or Cost Category | None | Small | Large[a] | Extra-Large[a] |
|---|---|---|---|---|
| General Practitioner | | | | |
| GR/V | $16.22 | $14.13 | $11.28 | $ 9.26 |
| C/V | 7.31 | 5.38 | 4.24 | 4.49 |
| NET R/V | 8.91 | 8.76 | 7.04 | 4.76 |
| General Surgeon | | | | |
| GR/V | 25.93 | 20.96 | 22.46 | 14.29 |
| C/V | 7.89 | 6.22 | 8.90 | 6.44 |
| NET R/V | 18.04 | 14.74 | 13.56 | 7.85 |
| Internist | | | | |
| GR/V | 18.76 | 18.41 | 13.24 | 20.40 |
| C/V | 6.37 | 6.40 | 5.80 | 7.58 |
| NET R/V | 12.39 | 12.01 | 7.44 | 12.82 |
| OB-GYN | | | | |
| GR/V | 20.02 | 23.25 | 22.03 | 15.78 |
| C/V | 7.48 | 8.34 | 8.71 | 6.54 |
| NET R/V | 12.54 | 14.91 | 13.32 | 9.24 |
| Pediatrician | | | | |
| GR/V | 15.87 | 11.79 | 12.00 | 9.08 |
| C/V | 5.28 | 4.50 | 4.87 | 4.39 |
| NET R/V | 10.59 | 7.29 | 7.13 | 4.69 |
| Total | | | | |
| GR/V | 17.94 | 17.18 | 15.31 | 11.75 |
| C/V | 6.99 | 5.99 | 6.19 | 5.24 |
| NET R/V | 10.95 | 11.19 | 9.12 | 6.51 |

[a] Excludes high income Medicaid practices

Key:
GR/V = gross revenues per visit
C/V = practice costs per visit
NET R/V = net revenues per visit (markups)

because of lower gross revenues per visit, not lower costs. Average costs per visit in LMPs are 96 percent of costs in SMPs, but gross revenues per visit are only 90 percent. ELMP gross revenues per visit are even lower (only 68 percent of SMPs). A breakdown by specialty shows essentially the same pattern of declining gross revenues and markups as Medicaid participation rises. No clear trend in unit cost exists within specialty, reinforcing the finding that markups are lower primarily because gross revenues are lower.

Ceteris paribus gross revenues per visit should decline with Medicaid participation because of low Medicaid fees. Tables VII-8,9 display usual and Medicaid fees for selected procedures by specialty and extent of Medicaid participation. As expected Medicaid fees for all procedures are below usual fees, in most instances considerably below. An LMP physician, for example, would receive $15.17 for a followup inpatient visit with a non-Medicaid patient, whereas Medicaid only pays $8.92, a difference of $6.25, or 41 percent.* If only one out or ten inpatient visits were Medicaid versus 40 percent for LMPs, average revenue per inpatient visit would be $16.15 ($16.93*0.9 + $9.11*0.1) and $12.67 ($15.17*0.6 + $8.92*0.4), respectively. LMP physicians would average only 78 percent of what SMP physicians would because of differences in Medicaid proportions and fees.

In sum, there is no evidence that LMPs or ELMPs as a group enjoy higher markups than physicians with small Medicaid practices; in fact, their markups are generally less, due in part to low Medicaid fees. Nor is there evidence that they skimp on costs, or alternatively, pad costs with large pension deferments and tax deductible officers' compensation. Finally, as a physician's practice becomes more and more Medicaid oriented, gross revenues and costs per visit fall, but revenues fall faster than costs, resulting in declining markups. These lower markups translate into lower incomes for ELMPs as shown earlier.

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*This is undoubtedly an overestimate by some unknown amount as physicians generally receive less than their usual fee, because of bad debts and reduced fees.

TABLE VI-8:

### USAL AND MEDICAID FEES FOR SELECTED PROCEDURES BY SPECIALTY BY SIZE OF MEDICAID PRACTICE

| Medicaid Practice Size<br>Fees | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| Hospital Visit | | | | |
| All: Usual | $16.64 | $16.93 | $15.17 | $14.38 |
| Medicaid | 8.60 | 9.11 | 8.92 | 9.66 |
| GP: Usual | 15.66 | 14.92 | 13.08 | 11.65 |
| Medicaid | 8.76 | 8.68 | 8.67 | 9.68 |
| GS: Usual | 16.90 | 18.54 | 19.83 | 16.92 |
| Medicaid | 8.26 | 9.08 | 11.15 | 8.50 |
| IM: Usual | 17.26 | 19.69 | 14.27 | 21.48 |
| Medicaid | 8.27 | 10.10 | 7.76 | 8.94 |
| OB: Usual | 18.57 | 16.86 | 14.46 | 17.32 |
| Medicaid | 8.76 | 8.95 | 8.66 | 11.03 |
| PED: Usual | 16.34 | 15.45 | 15.76 | 15.74 |
| Medicaid | 8.32 | 8.99 | 9.46 | 11.56 |
| Office Visit | | | | |
| All: Usual | 13.88 | 13.74 | 13.61 | 12.29 |
| Medicaid | 8.32 | 8.44 | 8.83 | 7.46 |
| GP: Usual | 11.27 | 11.82 | 11.46 | 10.69 |
| Medicaid | 8.28 | 7.71 | 8.54 | 6.75 |
| GS: Usual | 14.18 | 14.65 | 15.15 | 14.76 |
| Medicaid | 7.46 | 8.21 | 9.92 | 7.30 |
| IM: Usual | 16.14 | 15.98 | 14.09 | 15.58 |
| Medicaid | 8.05 | 9.53 | 7.53 | 8.15 |
| OB: Usual | 18.45 | 16.13 | 15.68 | 16.63 |
| Medicaid | 9.48 | 9.72 | 10.32 | 10.73 |
| PED: Usual | 13.50 | 12.04 | 12.59 | 12.95 |
| Medicaid | 7.39 | 8.20 | 10.10 | 10.00 |

TABLE VI-9:

## USUAL AND MEDICAID FEES FOR SPECIALTY-SPECIFIC PROCEDURES BY SIZE OF MEDICAID PRACTICE

| Medicaid Practice Size<br>Procedure | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| Hernia Repair (GS) | | | | |
| Usual | $373.79 | $401.99 | $473.36 | $355.14 |
| Medicaid | ------ | 210.66 | 220.97 | 154.17 |
| Diagnostic D & C (OB) | | | | |
| Usual | 214.37 | 187.39 | 206.39 | 206.14 |
| Medicaid | ------ | 89.43 | 98.72 | 115.73 |
| Electrocardiogram (IM) | | | | |
| Usual | 23.94 | 22.73 | 24.35 | 22.59 |
| Medicaid | ----- | 15.06 | 16.88 | 16.27 |
| Cholecystectomy (GS) | | | | |
| Usual | 654.39 | 656.34 | 693.96 | 605.19 |
| Medicaid | ------ | 318.15 | 366.02 | 321.89 |
| Proctoscope Exam (IM) | | | | |
| Usual | 25.84 | 27.75 | 27.61 | 26.98 |
| Medicaid | ----- | 17.19 | 17.31 | 20.25 |
| Delivery (OB) | | | | |
| Usual | 524.31 | 485.48 | 524.26 | 605.19 |
| Medicaid | ------ | 261.02 | 289.34 | 313.56 |
| Spinal Puncture (PED) | | | | |
| Usual | 32.88 | 31.50 | 32.09 | 28.65 |
| Medicaid | ----- | 18.28 | 16.42 | 17.56 |

## Ancillary Services

The excessive use of ancillary services is an identifying characteristic of Medicaid mills. Ancillary services such as laboratory tests and x-rays are not included as part of the physician's office visit fee, and are reimbursed separately by Medicaid. By prescribing and providing these services to Medicaid patients, the physician essentially raises the flat Medicaid portion of the demand curve and increases his own gross revenues. Alternatively, he may only order the ancillaries and receive additional revenues from an outside laboratory in the form of kickbacks. In either case, this not only drives up Medicaid program expenditures but, to the extent such services are unnecessary, is also poor quality care.

Although it is not possible to determine the medical necessity of the ancillaries provided in large Medicaid practices, we can compare the frequency with which they are ordered, compared with SMPs. The NORC survey asked each physician to estimate the percent of office visits for which he ordered four types of services: laboratory tests, injections or immunications, x-rays, and office surgery. Comparisons of ancillary utilization by Medicaid practice size are shown in Table VII-10. As much of the variance may be attributed to casemix difference, utilization rates are also presented by specialty. It is possible, that important casemix differences still remain, however. If Medicaid patients tend to be sicker, then we might expect higher utilization rates in larger Medicaid practices.

Large and extra-large Medicaid practices often show considerable variation from SMPs in their rates of ancillary utilization, but not always in the predicted direction. General surgeons and OB-GYNs with large Medicaid practices order significantly more tests, but internists and pediatricians actually prescribe significantly fewer. ELMP physicians, furthermore, use laboratory services at the same rate as their colleagues in small Medicaid practices.* Injections, however, appear to be used at exceedingly high rates in both LMPs and ELMPs relative to SMPs. This prescribing behavior is shared by all specialty groups except pediatricians, but is most pronounced among internists. ELMP internists order injections for almost one-half of all their office patients (45.2%), a rate almost three times that of SMPs (16.2%).

There are no differences in x-ray utilization by size of Medicaid practice and differences in office surgical rates are inconsistent, once broken down by specialty. General practitioners and internists in LMPs perform significantly more procedures while surgeons and ELMP pediatricians perform fewer. The absolute levels of office surgery are generally low, however, in all groups. Any Medicaid abuse of this service must take place on a very small scale.

In sum, evidence that large and extra-large Medicaid practices order excessive ancillaries is ambiguous at best. Higher utilization rates by one specialty are often offset by lower rates for another specialty. Injections do appear to be subject to general overuse in LMPs and by internists in ELMPs. If Medicaid patients required greater ancillaries, we would expect ancillary use to increase with the percentage of practice devoted to Medicaid patients. Yet ELMP ancillary utilization rates are often closer to SMP rates than LMP rates.

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*Laboratory tests are ordered more frequently in all Medicaid practice sizes, when the physician has internalized these services. ELMPs are significantly less likely to do their own labwork, however.

TABLE VI-10:

## ANCILLARY SERVICES BY SIZE OF MEDICAID PRACTICE

| Medicaid Practice Size<br>Service | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| Laboratory Tests: | 41.7% | 35.2% | 36.9% | 37.9% |
| General Practitioner | 39.7 | 31.7 | 36.7 | 35.5 |
| General Surgeon | 15.4 | 20.8 | 28.3** | 26.6 |
| Internist | 47.1 | 54.2 | 42.9** | 59.0 |
| OB-GYN | 53.5 | 47.0 | 58.7* | 57.0 |
| Pediatrician | 35.8 | 27.0 | 13.1*** | 28.2 |
| Injections: | 19.7 | 17.8 | 29.3*** | 30.3*** |
| General Practitioner | 25.0 | 24.9 | 35.1** | 29.3 |
| General Surgeon | 2.8 | 6.4 | 13.5** | 23.0 |
| Internist | 13.7 | 16.2 | 39.7*** | 45.2** |
| OB-GYN | 6.1 | 3.5 | 7.2** | 2.2 |
| Pediatrician | 44.4 | 33.7 | 37.6 | 29.0 |
| X-Rays: | 10.4 | 14.3 | 15.8 | 15.4 |
| General Practitioner | 10.8 | 12.7 | 13.2 | 12.3 |
| General Surgeon | 9.0 | 15.9 | 19.4 | 23.1 |
| Internist | 18.3 | 24.3 | 21.9 | 32.7 |
| OB-GYN | 4.9 | 3.6 | 6.2 | 5.3 |
| Pediatrician | 6.0 | 5.2 | 4.3 | 4.5 |
| Office Surgery: | 2.9 | 4.7 | 4.5 | 2.5 |
| General Practitioner | 2.0 | 3.1 | 5.1** | 2.5 |
| General Surgeon | 7.3 | 12.3 | 6.4*** | 3.3*** |
| Internist | 1.2 | 1.2 | 3.5** | 2.7 |
| OB-GYN | 5.2 | 4.6 | 3.8 | 5.4 |
| Pediatrician | 2.5 | 2.1 | 2.0 | 0.6*** |

## Inputs

In addition to his own time, the primary inputs to the physician's practice are auxillary staff, such as clerical and nursing personnel. Physicians vary considerably, however, in the number and type of such personnel and in the effectiveness with which they employ them. If large Medicaid practices are more efficient in their use of auxillary staff, this may explain their higher practice volume. By delegating tasks to clerical and nursing staff, these physicians may increase their total productivity (visits per physicin hour) and lower average costs per visit. Alternatively, large Medicaid practices may skimp on such inputs in order to lower practice costs and increase physician net revenues.

Table VII-11 presents the mean number of auxillary staff per physician by size of Medicaid practice, both overall and disaggregated by type. LMPs employ significantly more nonphysician personnel, notably clerks, LPNs, and nurse practitioners. Their higher use of LPNs may partially explain why LMP physicians see more patients per hour while more clerical personnel may be necessary to handle the added administrative work associated with Medicaid reimbursement. The ELMPs, however, do not employ significantly more clerks than SMPs, suggesting they either find Medicaid administrative procedures less onerous to deal with, or that they have become more proficient in obtaining payment. Although total-staff-to-physician ratios are not higher in ELMPs, these practices do utilize significantly more nursing personnel, both RNs and LPNs. This suggests that ELMP physicians may engage in considerably more medical task delegation than other physicians.

Large and extra-large Medicaid practices employ more auxillary staff of certain types than do SMPs. It is still possible, however, that the use of these aides does not raise productivity because of poor managerial ability on the part of the physician, inappropriate task delegation, etc. The impact of auxillary staff on physician productivity is compared for SMPs and LMPs in Table VII-12. (Due to small cell sizes, large and extra-large Medicaid practices have been combined.) Physician productivity is defined as total number of visits per physician hour of patient care. Both SMPs and LMPs show steadily rising rates of productivity as the number of aides increases; visits per hour increase over 50 percent when the number of staff goes from less than one to three or more. LMPs do exhibit slightly higher physician productivity overall (3.5 visits per hour vs. 3.3 in SMPs), apparently due to their greater use of aides. Casemix differences may limit the amount of task delegation, and thus productivity estimates are presented separately by specialty as well. Not surprisingly, general practitioners and pediatricians in both SMPs and LMPs show the largest productivity gains through the use of aides. These two specialties provide a large amount of routine preventive and maintenance care that is more easily delegated to nonphysician personnel. General surgeons do not appear to benefit from the use of auxillary staff, but this may be a partial misspecification. They provide a large proportion of their total visits in the hospital, where they can make extensive use of nursing inputs that are not included here.

TABLE VI-11:

## AUXILLARY STAFF[a] BY SIZE OF MEDICAID PRACTICE (means)

| Medicaid Practice Size<br>Type | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| Total | 1.57 | 2.10 | 2.58*** | 2.43 |
| Clerks | 0.87 | 1.22 | 1.60*** | 1.01 |
| RNs | 0.25 | 0.31 | 0.29 | 0.54*** |
| LPNs | 0.19 | 0.22 | 0.32** | 0.58*** |
| Technicians | 0.24 | 0.29 | 0.35 | 0.21* |
| Nurse Practitioners | 0.03 | 0.06 | 0.03** | 0.09 |

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[a] All staff are expressed as full-time equivalents per physician.

TABLE VI-12:

## IMPACT OF AUXILLARY STAFF ON PHYSICIAN PRODUCTIVITY IN SMPs AND LMPs[a]

| MD Productivity (Visits/Hour) | Number of Aides Per MD | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0-0.9 | | 1.0-1.9 | | 2.0-2.9 | | 3.0 + | | Total | |
| | SMP | LMP | SMP | LMP | SMP | LMP | SMP | LMP | SMP | LMP |
| General Practice | 2.6 | 3.3 | 3.6 | 3.7 | 3.4 | 4.3 | 4.4 | 4.6 | 3.6 | 4.1 |
| General Surgery | 3.0 | 2.5 | 2.8 | 3.9 | 3.1 | 3.3 | 4.0 | 2.5 | 3.0 | 3.0 |
| Internal Medicine | 1.9 | 2.1 | 2.9 | 3.0 | 3.4 | 3.7 | 3.6 | 3.2 | 3.1 | 3.2 |
| OB-GYN | 2.6 | 2.8 | 2.8 | 2.8 | 3.1 | 2.6 | 3.2 | 3.4 | 2.9 | 3.0 |
| Pediatrics | 3.1 | 2.7 | 3.9 | 3.5 | 4.0 | 3.2 | 4.3 | 4.3 | 3.8 | 3.7 |
| Total | 2.7 | 2.6 | 3.2 | 3.4 | 3.4 | 3.8 | 4.1 | 3.8 | 3.3 | 3.5 |

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[a] Includes both large and extra-large Medicaid practices

In sum, large and extra-large Medicaid practices do not appear to be skimping on labor inputs; they tend to employ more auxillary staff, expecially clerks and nursing personnel. This may explain the higher volume achieved in these practices with only a minor reduction in the amount of time spent with the physician. Holding the number of aides constant, however, these large Medicaid practices are not appreciably more productive.

### Practice Size and Organization

Practice costs may be higher (or lower) in LMPs and ELMPs if their organizational form varies from that of other practices. Groups may achieve lower average visit costs than solo practices through economies of scale. Medicaid expenditures per patient may be higher, however, if excessive referrals are made to other physicians within the group (an alleged characteristic of Medicaid mills). Incorporation of a practice may have the dual effect of raising total practice costs and individual physician net (after tax) incomes. Rather than receiving net practice revenues (gross revenues minus costs) as taxable personal income, the incorporated physician(s) can reallocate some part of it to practice costs in the form of pensions and officers' compensation. Medicaid mills may be more likely to incorporate and thus take advantage of this tax loophole.

Table VII-13 compares these two organizational attributes, practice size and incorporation. Contrary to expectation, LMPs and ELMPs are significantly more likely to be solo and unincorporated practices. Sixty percent of SMPs are solo practices as compared with three-quarters of the LMPs. By contrast, only 3.3 percent of LMPs are 6-9 physician groups, a slightly lower percentage than SMPs (3.8%). Apparently, the vast majority of Medicaid patients being treated in large Medicaid practices are not being processed through large, multispecialty groups; most are being seen by solo or small group practitioners. Also surprising is the fact that SMPs, rather than LMPs, are more likely to be incorporated. Nearly one-half of SMPs are incorporated compared to only one out of the five ELMPs. This further contradicts the basic image of LMPs as large, incorporated "clinics", processing hoards of Medicaid patients while enjoying extraordinary incomes.

TABLE VI-13:

## PRACTICE ORGANIZATION BY SIZE OF MEDICAID PRACTICE

| Organization \ Medicaid Practice Size | None | Small | Large | Extra-Large |
|---|---|---|---|---|
| Size: | | | | |
| Solo | 65.2% | 61.6% | 74.4%*** | 88.7%*** |
| 2 - 5 MDs | 21.8 | 32.0 | 21.7 | 8.8 |
| 6 - 9 MDs | 6.8 | 3.8 | 3.3 | 0.3 |
| Prepaid | 6.2 | 2.5 | 0.6 | 2.2 |
| Total | 100.0% | 100.0% | 100.0% | 100.0% |
| Incorporation | 38.7% | 46.2% | 36.2%*** | 21.2%*** |

# VII. MULTIVARIATE ANALYSIS OF PRIMARY CARE PHYSICIANS

Physicians with large Medicaid practices have been shown to differ from other physicians in significant ways, such as credentials, caseload, practice style, and net incomes. Many of these descriptive findings were consistent with Chapter III's theory, but leave two major questions unanswered. Are these LMPs really mills, and how can we explain the physician's decision to run an LMP? This chapter will address both of these questions. First, discriminant analysis is used to determine whether LMPs and ELMPs can truly be differentiated from other Medicaid practices along "mill-like" characteristics. Second, probit analysis is used to test certain behavioral hypotheses and analyze the probability that an SMP physician will choose to operate a larger Medicaid practice.

## Discriminant Analysis of Large Versus Small Medicaid Practices

Practices with a large proportion Medicaid patients have been characterized as "mills", high-volume, low-quality operations run by highly paid physicians with few credentials. Results presented in the previous chapter found that LMPs and ELMPs did in fact have some of these characteristics. Many of these characteristics are intercorrelated, however, (such as physician age, specialty, and board-certification), and crosstabular analysis does not adequately control for this. If large Medicaid practices are truly different from smaller Medicaid practices in ways that affect quality of care, we should be able to statistically distinguish between the two groups.

In Chapter III, we identified two sets of variables that distinguish mills from other kinds of Medicaid practices. First, Medicaid mill physicians are expected to be earning higher incomes on average. Second, the process of medical care will be significantly poorer in mills, as measured by shorter visit lengths, higher rates of ancillary utilization, and fewer inputs. While Medicaid mills may be run by less well trained physicians, this is not a necessary condition for a mill. Physicians in accidental LMPs will almost always have fewer credentials. Nevertheless, for policy purposes, we are concerned about a relative lack of training in LMPs, as this will restrict access by the poor to specialized services. If LMPs (and ELMPs) are a unique group, then a discriminant function with these variables (income, process measures of quality, and credentials) should distinguish them from other physician practices.

### Empirical Specification

Group Variable: Two groups of practices will be analyzed: small and large Medicaid practices. (Nonparticipants are omitted from this analysis.) As we observed earlier that practice characteristics are often different in LMPs and ELMPs, we will derive two discriminant functions: (1) where LMP is defined as practices with 30 percent or more Medicaid patients (which we will call MILL1 for identification purposes), and (2) LMPs defined as at least 50 percent Medicaid patients versus all other Medicaid practices (MILL2). The same discriminating variables will be used with each function.

Discriminating Variables: Three sets of discriminating variables are included: income, process measures of quality, and credentials. In order to adjust for differences in hours worked, the income variable is defined as the physician's imputed hourly wage (MDWAGE). Physicians in large Medicaid practices are hypothesized to be distinguished by their higher net earnings, ceteris paribus.

Process Measures: If large Medicaid practices tend to be mills, then they should be characterized by lower quality care on all dimensions. In particular, physicians in these practices shouuld spend less time with patients, order more ancillary services, and employ fewer aides. The variable LOV is the length of time spent with each office patient, measured as fractions of an hour. The variables TEST, SHOT, XRAY, and SURG are specified as the percent of office patients for whom the physician ordered laboratory tests, injections, x-rays, and office surgery, respectively. AIDE is the number of auxillary staff employed in the practice, and is expressed as fulltime equivalents per physician.

Credentials: Physician credentials include specialty, board-certification, FMG status, age, and hospital affiliations. These variables are included in part as adjustments for the process measures; variations in ancillary utilization between the two groups may reflect differences in specialty mix. The credentials are also of analytic interest in their own right. LMP physicians are expected to be distinguished from others as older, general practitioners and foreign medical graduates, without board-certification or hospital affiliation. Specialty is specified as four dummy variables, GS, IM, OB, and PED for general surgeons, internists, OB-GYNs, and pediatricians, respectively. General practitioners constitute the omitted category. BOARD and FMG both assume the value one if the physician is board-certified, or if he is a Third World FMG. The variables, MDAGE and HOSAFIL, are set equal to one if the physician is 60 years or older, and if he lacks hospital affiliations, respectively.

Analytic Method: Discriminant analysis is used to distinguish between SMPs and LMPs. A discriminant function is derived that separates the two groups as much as possible, as measured by a multivariate F ratio. The standardized discriminant coefficients can be interpreted in much the same way as beta weights from a regression equation. The signs, magnitude, and statistical significance of these coefficients indicate their relative importance in distinguishing between the two groups. The overall success of the discriminant function in separating the two groups is measured by Wilks' lambda ($\lambda$), which can range from zero to one; the smaller lambda is, the better the discriminating power of the function. A second measure of the function's ability to discriminate between the two groups is its associated canonical correlation ($R_c$); the higher the square of this correlation, the greater the variance in the function explained by the groups.

## Empirical Findings

Means of the variables used in the discriminant functions are displayed in Table VII-1. The first pair of means (MILL1) are for practices with fewer than 30 percent Medicaid patients, and 30 percent or more respectively; the second pair are means for practices with less than 50 percent

TABLE VII-1

## DISCRIMINANT ANALYSIS RESULTS FOR SMALL VERSUS LARGE MEDICAID PRACTICES

| | Discriminant Functions | | Means | | | |
|---|---|---|---|---|---|---|
| | | | MILL1 | | MILL2 | |
| Variables | MILL1 | MILL2 | SMP | LMP | SMP/LMP | ELMP |
| MD WAGE | 0.36*** | 0.47*** | 24.34 | 21.92 | 24.24 | 18.22 |
| LOV | 0.13 | a | 0.33 | 0.31 | 0.32 | 0.33 |
| TEST | a | a | 35.23 | 37.12 | 35.46 | 38.01 |
| SHOT | -0.75*** | -0.40*** | 17.75 | 29.65 | 19.45 | 30.47 |
| XRAY | a | -0.14 | 14.32 | 15.73 | 14.54 | 15.42 |
| SURG | 0.16* | 0.19* | 4.74 | 3.89 | 4.71 | 2.44 |
| AIDE | -0.24*** | a | 2.11 | 2.52 | 2.17 | 2.43 |
| BOARD | 0.31*** | 0.38*** | 0.43 | 0.27 | 0.41 | 0.16 |
| FMG | -0.16* | 0.31*** | 0.05 | 0.11 | 0.06 | 0.02 |
| MDAGE | -0.23*** | -0.36*** | 0.29 | 0.36 | 0.29 | 0.46 |
| HOSAFIL | -0.18** | -0.28*** | 0.01 | 0.03 | 0.02 | 0.05 |
| GS | -0.30*** | a | 0.21 | 0.18 | 0.21 | 0.10 |
| IM | -0.35*** | 0.19* | 0.21 | 0.26 | 0.22 | 0.15 |
| OB | -0.52*** | a | 0.10 | 0.07 | 0.10 | 0.03 |
| PED | -0.11 | -0.13 | 0.08 | 0.09 | 0.08 | 0.12 |
| | $\lambda=0.92$[b] | $\lambda=0.94$[b] | | | | |
| | $R_c=0.29$ | $R_c=0.24$ | | | | |

[a] F-ratio insufficient for entry

[b] Associated chi-square statistic significant at 1 percent level

* F-ratio significant at 10 percent level

** F-ratio significant at 5 percent level

*** F-ratio significant at 1 percent level

Medicaid patients, and 50 percent or more. Results from the discriminant analysis also are presented in Table VII-1. The statistically significant coefficients associated with many of the variables indicate that both functions do discriminate between the two groups. A negative sign indicates that large Medicaid practices share a particular characteristic, e.g., have more FMGs, and that this characteristic distinguished them from smaller Medicaid practices. Not all signs are in the hypothesized direction, however, and several coefficients reverse signs between the two functions. These results are not completely surprising, however, as Chapter VI's descriptive findings had shown substantial variation between LMPs and ELMPs.

MDWAGE, the physician's imputed net hourly wage, is a significant discriminatory variable in both functions. Regardless of how we define large Medicaid practices, physicians in these practices are distinguished from smaller Medicaid practices by their lower per hour earnings. If they were mills, however, we would have expected higher incomes rather than less. It does not appear that large Medicaid practices can be considered mills, based on their income-maximizing ability.

Six process measures of quality were included in the analysis. If large Medicaid practices were mills providing poor quality care, then the four ancillary service variables (TEST, SHOT, XRAY, and SURG) should have significant negative coefficients, and the coefficients for the input variables (LOV and AIDE) should have significant, positive signs. The results are mixed; several of the process measures do not differentiate the two groups. LMPs have only a single mill-like characteristic; physicians in these practices do order significantly more injections. The relative magnitude of this coefficient nevertheless indicates that SHOT is a powerful discriminatory variable. Large Medicaid practices, however defined, do not significantly differ from smaller practices in the frequency with which tests and x-rays are ordered, and actually order fewer office surgical procedures. Finally, these large Medicaid practices are not skimping on the quality or intensity of inputs. There is no difference in the amount of time the physician spends with his office patients, and in the first function (MILL1) the LMP physician actually employs more aides.

Credentials clearly separate the LMP physician from his SMP counterpart. In the first discriminant function, we see that large Medicaid practices are characterized by their higher proportion of specialists, in particular, significantly more general surgeons, internists, and obstetricians. These specialists tend to be less qualified than those in SMPs, however; they are significantly less likely to be board-certified. When we define LMPs as at least 50 percent Medicaid (MILL2), LMPs do not differ from other practices in their mix, except for fewer internists. Again, they are less likely to be run by board-certified physicians. The FMG variable is also significant, but with opposite signs in the two functions. LMPs physicians are characterized as Third World FMGs in the first function, but as U.S. or Western European medical graduates in the second.

Both MDAGE and HOSAFIL are significant discriminatory variables, with the expected signs in the two functions. LMPs, however defined, are run by older physicians without hospital affiliations. Without access to more sophisticated hospital-based services (and probably without the training to use them anyway), these physicians presumably treat a less acutely ill patient population.

The ability of either function to discriminate between the two groups is quite limited. Although statistically significant, Wilks' lambda remains very high (0.92 to 0.94), indicating that the variables chosen do not clearly separate LMPs from SMPs. The canonical correlation squared also shows that group membership leaves much of the variance in each discriminant function unexplained.

## Conclusions

Discriminant analysis has revealed some significant differences between SMPs and LMPs, defined first as 30 percent or more Medicaid, and then at 50 percent. Can we conclude that either type of LMP is a Medicaid mill? The answer would seem to be no. The theory in Chapter III identified two important characteristics of a mill: high physician incomes and poor quality care. High incomes are not a distinguishing characteristic of LMP physicians, however; even after adjustment for specialty and work effort, these physicians earn significantly less. The quality of medical care in LMPs also appeared to be as good as that in smaller Medicaid practices. LMP physicians used inputs with the same or greater intensity in their production of health services, including both the physicians' own time and that of auxillary personnel. With one important exception, furthermore, LMP physicians did not overuse ancillary services. Utilization rates for laboratory tests, x-rays, and office surgery were comparable with those in SMPs. Injections, on the other hand, were ordered at a much higher, and possibly excessive, rate; in fact, this is one of the most distinguishing characteristics of an LMP, as measured by the size of the SHOT coefficient. Unmeasured casemix variations might account for some of this difference, but specialty does provide a partial adjustment. Nevertheless, the fact that only one of six quality measures is suggestive of poor care in LMPs would not appear to define these practices as mills.

LMPs do appear to be dominated by less well trained physicians; they tend to be older and to lack hospital affiliations. Although many are specialists, they are usually not board-certified in that specialty. Their relative lack of credentials does not qualify them as mill operators; instead, many are undoubtedly running LMPs by default rather than by design, the victims of changing residential patterns and their own immobility.

### Probit Analysis of Large Versus Small Medicaid Practices

Physicians with large Medicaid practices have been shown to differ from other physicians in significant ways, such as credentials, caseload, and geographic location. These descriptive findings, while generally consistent with Chapter III's theory, do not allow us to identify which variables best explain a physician's decision to devote a large share of his practice to Medicaid patients. Are physicians in small metropolitan areas, for example, more likely to run LMPs because they are older general practitioners, because input prices are lower, or because the Medicaid-eligible pool is larger? Multivariate analysis will enable us to disentangle these competing effects and to directly test hypotheses. Using the conceptual model developed in Chapter III, we analyze the probability that an SMP physician will choose to operate a larger Medicaid practice.*

### Empirical Specification

Dependent Variable: The dependent variable is specified as a dichotomous variable in which "one" signifies that the physician runs a large Medicaid practice, and "zero," a small Medicaid practice. As the purpose of this analysis was to distinguish solely between large and small Medicaid practices, non-participants were omitted. This alters the prediction and interpretation of causal variables in definite respects. For example, outward shifts in private demand should unequivocally reduce the percentage of LMPs in the total practice population (including non-participants). Whether such a shift has the same effect on the mix of SMPs and LMPs, however, is generally ambiguous because nonparticipants have been dropped in the calculation of LMP probabilities and nonparticipation is correlated with income. High income areas should have fewer LMPs; they may or may not have fewer SMPs. The ultimate effect on mix will depend on the distribution of practices around the drop-out kink and the arbitrary definition of an LMP. Several of the tested hypotheses are stated in unambiguous terms as if nonparticipants were included. For many of the variables, the theory is insensitive to the inclusiveness of the sample anyway. Anomalous results will be expanded on by referring to the likely mix of practices in a community.

In order to test the sensitivity of parameter estimates to the definition of an LMP, the dependent variable assumes two LMP definitions: (1) LMPs are defined as practices with 30 percent or more Medicaid patients (LMP30); and (2) LMPs are restricted to those practices with at least one-half their patients Medicaid (LMP50). The identical equation was estimated with each of these specifications.

Independent Variables - Fee Schedules: Two variables were included to measure the influence of relative fee schedules on the physician's decision to run a large Medicaid practice: the Medicaid fee for a routine office visit (MCDFEE), and Blue Shield's allowed fee for the same procedure (BSFEE). Both variables are defined for the physician's state. The Blue Shield fee was used as a measure of the relative generosity of private third party payors. Fees, as well as all other monetary variables, were adjusted for area cost-of-living differences.

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*Unfortunately, the 1976 survey did not collect data on two important categories of explanatory variables: (1) measures of the administrative costs incurred in collecting from Medicaid ; and (2) physicians' political attitudes. Both sets of variables were significant predictors of Medicaid participation in Sloan, Mitchell, and Cromwell (1978). These variables were less powerful in participants-only equations, however, suggesting that they are more important in explaining the decision to participate, rather than the level of participation once the decision is made.

Whether higher Medicaid fees increase the probability of a practice being an LMP will depend on (a) the number of nonparticipants near the drop-out kink and (b) the elasticity of supply. An elastic supply will increase the probability of encountering an LMP as physicians respond to higher Medicaid fees by expanding their Medicaid caseload. Offsetting this would be the entrance of previous nonparticipants, enticed into seeing a small number of Medicaid patients by higher fees. While higher Medicaid fees should increase participation overall, it is impossible to predict a priori the effect on the size distribution of Medicaid practices among participants. Higher Blue Shield fees shift private demand out, causing SMPs and LMPs to substitute private for Medicaid patients. The relative rate at which SMPs drop out of the program and LMPs shrink to SMPs will determine the likelihood of finding an LMP among the remaining participants. Again, this is not known a priori.

Physician Credentials: Physician credentials include specialty, board-certification in a specialty, and FMG status. Specialists have undergone more years of professional training than have general practitioners, and will be able to set higher fees for their services. They thus are less likely to accept large numbers of low marginal revenue Medicaid patients. Time with patients is also likely to be greater, lowering productivity. The dummy variables, GS, IM, OB, and PED, represent general surgeons, internists, obstetrician-gynecologists, and pediatricians, respectively. General practitioners represent the omitted category.

Board-certified physicians and U.S. medical graduates are both generally considered to be of higher technical quality, and hence face a greater demand for their services. As a result, they are hypothesized to have less incentive to run large Medicaid practices. BOARD and FMG both assume the value one if the physician is board-certified, or if he is a Third World FMG. A Third World FMG is defined as a graduate of a medical school in a non-English-speaking, non-Western European country. (An exception is made for graduates of Mexican medical schools, many of whom are Americans who studied there.)

Physician Age: The older physician is likely to face a drop in demand for his services in the fee-setting market, as referring physicians increasingly opt for younger physicians more fully acquainted with the latest medical techniques. If so, he may begin to supply more services in the price-taking (Medicaid) market, and be more likely to run a large Medicaid practice. Alternatively, if older physicians wish to reduce their workloads, they may drop low marginal revenue patients first. Older physicians would then be less likely to run large Medicaid practices. Competition versus work effort effects of age must be tested empirically. Physician age is specified as a dummy variable (MDAGE), that assumes the value one if the physician is sixty years of age or older.

Community Demand Variables: The demand for physician visits is influenced, inter alia, by the ability to pay of the patient population in the physician's county. Two variables measure ability to pay: income for private patients and

Medicaid coverage for poor patients. The variable Y measures per capita income in the physician's county and is hypothesized to raise demand in the fee-setting market. Physicians are thus less likely to run large Medicaid practices in high income areas. The variable, MCAID, measures Medicaid recipients as a percentage of county population.* Physicians are hypothesized to run large Medicaid practices when the pool of Medicaid patients is relatively high.

As the physician-population ratio rises, demand per physician falls in the fee-setting market, encouraging higher levels of Medicaid participation. This ratio is hypothesized to be positively related to large Medicaid practices. MDPOP is defined as the number of office-based, patient care physicians per 1,000 county population.

Practice Costs: When wage rates rise for non-physician personnel, it is less likely that the Medicaid allowed fee will provide sufficient marginal revenue to cover increased practice costs. High wage rates should discourage large Medicaid practices. The variable WAGE is a county index of wage rates of nonphysician personnel.

Geographic Regions: Regional effects, including variations in supply characteristics, charity, and discrimination, are proxied by geographic location in the country. NEAST, SOUTH, and WEST represent the Northeast, South and West census regions, respectively. The North Central region constitutes the omitted category. Ceteris paribus, LMPs should be more prevalent in the South because of higher physician nonparticipation in public benefit programs (possibly due to discrimination or conservative political attitudes).

Estimation Methods: With a qualitative, zero-one, dependent variable (SMP=0, LMP=1), ordinary least square methods are inefficient because of the concentration of values at two extremes. Multivariate probit analysis is preferred because it constrains the predicted values of the dependent variable to the unit (0,1) interval (Goldberger, 1964). In the probit model, the conditional expectation is given by

$$E(y_i/\hat{I}_i) = \text{Prob}(y_i=1/\hat{I}_i) = F(\hat{I}_i),$$

where $F(\hat{I}_i)$ = the ordinate of the cumulative normal distribution, which forms an S-shaped curve in the unit interval. The $y_i$ take on values of zero or one, depending on whether the practice is an SMP or an LMP. The predicted probit index, $\hat{I}_i$, is calculated by multiplying the estimated maximum likelihood coefficients times the appropriate values of the independent variables. The conditional probability of the practice being an LMP (i.e., $y_i = 1$) can then be determined by looking up values of $\hat{I}_i$ in a cumulative normal distribution table.

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* No data on Medicaid enrollments are available below the state level, but data on the percentage of population below poverty are available by county from the 1970 U.S. Census. Taking each state's mean poverty proportion as 1.0, we developed a poverty index for counties in that state. This index multiplied by state estimates of Medicaid patients as a percentage of population yielded our Medicaid coverage variable (MCAID).

Interpretation of probit results, therefore, is a two step process, unlike OLS estimates which have direct implications (e.g., the coefficient of income in a consumption function is the marginal propensity to consume). Estimates must first be converted using the cumulative normal distribution before impacts on conditional probabilities can be determined. Signs of coefficients and statistical significance do give direction of effects on probabilities, however.

## Empirical Findings

Four regression equations and means for the dependent and all explanatory variables are displayed in Table VII-2. OLS regression results (Regs. 1 and 2) have been included for comparative purposes. Where there are differences, greater reliance should be placed on the probit results (Regs. 3 and 4). Although the regressions leave much of the variation unexplained, many of the coefficients are statistically significant in the hypothesized direction. Certain parameter estimates, however, change in magnitude or sign between the two probit equations, suggesting behavioral differences between LMPs and ELMPs.

Because the probit coefficients are not directly interpretable, a table of marginal impacts of selected, statistically significant variables is provided (Table VII-3). Elasticities are calculated for continuous variables, marginal effects for discrete, dummy variables. For example, a one percent increase in the size of the Medicaid pool (MCAID) results in a 0.49 percent increase in the probability that the practice is an LMP rather than an SMP. Marginal effects simply give the absolute change in the probability of observing an LMP associated with positive values of the discrete independent variables. Thus, being board-certified reduces the probability that a practice is an LMP by 8.6 percentage points (around a mean of 20 percent).

The fee schedule variables are generally insignificant, implying that Medicaid fees have no net effect on the size distribution of Medicaid participants. Evidently the incentive to expand Medicaid caseloads with more generous fees is offset by the entrance of previous nonparticipants, leaving the mix of SMPs and LMPs unaffected. Higher Blue Shield fees, reflecting an outward shift in private demand, reduces the likelihood of observing an LMP among participants, but only for the 30 percent cut-off point separating SMPs and LMPs. Fewer SMPs evidently decide not to participate with higher Blue Shield fees than LMPs which cut back on Medicaid caseloads to now become SMPs under the 30 percent definition. Using the 50 percent cut-off, Blue Shield fees become insignificant which makes sense. Few ELMPs reduce Medicaid caseloads enough to become SMPs (now defined to include practices up to 50 percent Medicaid). The few that do roughly match the number who decide not to participate.

It was hypothesized that specialists face a higher private demand for their services than do general practitioners, and hence are less likely to operate LMPs of whatever size. Yet, the specialty parameter estimates appear to be highly sensitive to the definition of LMP used. When defined as practices with 30 percent or more Medicaid patients, the four specialties are more likely to run LMPs, internists and pediatricians significantly so. Using a 50 percent cut-off, on the other hand, three specialist groups (internists, general surgeons, and OB-GYNs) are significantly less likely to be found in LMPs. While specialists can command higher fees for their services, their demand also is more inelastic; as fees fall, for example, more patients may

TABLE VII-2 :

REGRESSION RESULTS FOR LARGE VERSUS SMALL MEDICAID PRACTICES
(t-values in parentheses)

| | Regressions[a] | | | | Means |
|---|---|---|---|---|---|
| Variables | 1. LMP30 OLS | 2. LMP50 OLS | 3. LMP30 Probit | 4. LMP50 Probit | |
| LMP30 | --- | --- | --- | --- | 0.20 |
| LMP50 | --- | --- | --- | --- | 0.06 |
| MCDFEE | -0.05 | 0.20 | -0.88 | 1.40 | 8.49 |
| | (0.11) | (0.79) | (-0.54) | (0.54 | |
| BSFEE | -0.75 | -0.17 | -3.01 | -0.08 | 12.24 |
| | (-1.83)* | (-0.66) | (-1.88)* | (-0.03) | |
| IM | 8.19 | -5.50 | 33.20 | -50.54 | 0.22 |
| | (2.77)*** | (-3.04)*** | (3.02)*** | (-2.94)*** | |
| GS | 4.30 | -5.48 | 11.54 | -50.62 | 0.21 |
| | (1.54) | (-3.21)*** | (1.04) | (-2.90)*** | |
| OB | 4.16 | -6.85 | 18.10 | -49.01 | 0.09 |
| | (1.09) | (-2.93)*** | (1.20) | (-2.01)** | |
| PED | 7.43 | -1.33 | 24.71 | -12.30 | 0.08 |
| | (1.95)* | (-0.57) | (1.71)* | (-0.65) | |
| BOARD | -10.09 | -6.07 | -44.24 | -68.79 | 0.40 |
| | (-4.82)*** | (-4.72)*** | (-5.35)*** | (-5.11)** | |
| FMG | 10.33 | -8.18 | 31.20 | -147.02 | 0.06 |
| | (2.55)** | (-3.29)*** | (2.21)** | (-3.21)*** | |
| MDAGE | 3.06 | 3.54 | 8.79 | 25.81 | 0.30 |
| | (1.49) | (2.80)** | (1.13) | (2.38)** | |
| Y | -0.004 | -0.00 | -0.02 | -0.00 | 5285.70 |
| | (-2.64)** | (-0.27) | (-2.57)** | (-0.12) | |
| MCAID | 198.63 | 37.25 | 579.98 | 399.75 | 0.05 |
| | (4.22)*** | (1.29) | (3.32)*** | (1.60) | |
| MDPOP | 6.48 | 5.60 | 24.19 | 43.83 | 1.09 |
| | (2.56)** | (3.6)*** | (2.50)** | (3.20)*** | |
| WAGE | 0.47 | 0.33 | 1.41 | 3.01 | 4.61 |
| | (0.87) | (0.99) | (0.71) | (1.03) | |
| NEAST | -0.64 | 9.12 | 2.47 | 77.11 | 0.28 |
| | (-0.23) | (5.43)*** | (0.22) | (4.52)*** | |
| SOUTH | 10.19 | 3.02 | 36.87 | 39.64 | 0.27 |
| | (3.58)*** | (1.73)* | (3.23)*** | (2.12)** | |
| WEST | 16.64 | 0.66 | 65.50 | 3.00 | 0.22 |
| | (5.38)*** | (0.34) | (5.49)*** | (0.15) | |
| CONSTANT | 24.31 | 0.08 | -53.21 | -240.83 | |
| | | | (-1.52) | (-4.26)*** | |
| | $R^2$(c)=.08<br>F(16,1752)=10.72*** | $R^2$(c)=.07<br>F(16,1752)=8.70*** | | | |

[a] Coefficients are multiplied by 100

[*] Significant at 10 percent level

[**] Significant at 5 percent level

[***] Significant at 1 percent level

TABLE VII-3:

## IMPACT OF INDEPENDENT VARIABLES ON LARGE MEDICAID PRACTICES

| Variable | Elasticity[a] LMP30 | Elasticity[a] LMP50 | Marginal Effect[b] LMP30 | Marginal Effect[b] LMP50 |
|---|---|---|---|---|
| MCDFEE | c | c | --- | --- |
| BSFEE | -0.60 | c | --- | --- |
| IM | --- | --- | 7.5 | -2.9 |
| GS | --- | --- | c | -2.9 |
| OB | --- | --- | c | -2.5 |
| PED | --- | --- | 5.6 | c |
| BOARD | --- | --- | -8.6 | -4.6 |
| FMG | --- | --- | 7.3 | -3.9 |
| MDAGE | --- | --- | c | 2.1 |
| Y | -1.65 | c | --- | --- |
| MCAID | 0.49 | c | --- | --- |
| MDPOP | 0.46 | 1.10 | --- | --- |
| WAGE | c | c | --- | --- |
| NEAST | --- | --- | c | 7.9 |
| SOUTH | --- | --- | 8.2 | 3.4 |
| WEST | --- | --- | 16.2 | c |

[a] A 10 percent increase was assumed for each independent variable.

[b] Multiplied by 100.

[c] Independent variable was insignificant.

undergo elective surgery, but demand is certainly limited. Primary care specialists may be willing to see a broader range of patients, treating illnesses unrelated to their specialty, but personal desires and referral patterns may place limits on the actual substitution of general for specialized care. Thus, it may be impossible for specialists in certain areas to concentrate solely on non-Medicaid patients to generate sufficient caseloads. Because of their skills, they may also be morally bound to treat a certain number of Medicaid patients. Hence, we find a surprisingly large percentage of specialists running reasonably large Medicaid practices (between 30 and 50 percent Medicaid). For similar reasons, we do not find many specialists concentrating solely on Medicaid patients, on the other hand. The need for their specialized skills is not there, and certainly the low Medicaid fees make serving the market unattractive at the margin.

What kinds of specialists are seeing large numbers of Medicaid patients? Apparently those that are less often board-certified. They are also more likely to be FMGs although this depends on the definition of an LMP. Why FMGs are significantly less likely to be running an ELMP is unknown. Possibly it has to do with the intraregional distribution of FMGs. They may locate in large cities where private demand is significant relative to the Medicaid population. They may be seeing all the Medicaid patients they can, but this only raises their participation to 30-50 percent. If private demand and the Medicaid population were well measured, this hypothesis could not be maintained, but knowing the error in the proxies used, it is quite possible the FMG dummy contains some residual location information as well.

The MDAGE coefficient is positive in both probit equations, and significant with the LMP50 specification. Older physicians appear more than willing to offset falling private demand with increased supplies of Medicaid visits.

Variations in public and private demand have the expected impacts on physician participation levels. In higher income areas, physicians supply more private visits and thus maintain smaller Medicaid practices. When public demand is high, on the other hand, as measured by a large Medicaid-eligible pool, physicians are willing to supply more Medicaid visits and operate larger Medicaid practices. Neither of these variables (Y and MCAID) are significant when the "extra-large" definition of LMP is used, suggesting that these demand variations are more important predictors at lower Medicaid participation levels. A large Medicaid program, in other words, will encourage LMPs, but mostly in the range of 30-50 percent Medicaid.

The probability of a physician running a large Medicaid practice is greatly increased in physician-dense areas, however, as shown by the significant, positive MDPOP coefficient in both equations. This is particularly important for policy purposes, for it suggests that physicians will respond to increased competition in the private market by supplying more and more visits to Medicaid patients.

The WAGE coefficient was not significant in either equation, suggesting that labor costs do not affect the decision to run a LMP. Theory had predicted a negative relationship, i.e., that physicians in high wage areas would decline to see large numbers of Medicaid patients.

Finally, the regional dummy variables indicate strong geographic variations in LMPs above and beyond those captured by other variables, such as MDPOP and

MCAID. Physicians in the South and West are more likely to devote 30 percent or more of their practice to Medicaid patients. Using the 50 percent LMP definition, the probability of running an LMP is higher in both the South and North East. To the extent that private demand, the Medicaid pool, and the distribution of physician supply are held constant, geographic region may be a proxy for variations in non-maximizing behaviors, such as discrimination. Dislike for government programs or Medicaid patients may lead to greater inequalities in Medicaid practice size in certain areas, such as the South. In particular, physician nonparticipation rates will be higher, leaving large numbers of Medicaid patients to be served by a smaller number of participating physicians.

## VIII. HIGH INCOME LMPs: ARE THEY MEDICAID MILLS?

The high income (>$80,000) LMP (HILMP) is an unusual phenomenon: Only 60 out of a primary care sample of 1862 exist. Considering the low Medicaid fees they receive for a large percentage of their patients, how do they manage to enjoy incomes so much higher than other LMPs with similar revenue constraints? Even more puzzling is why their incomes are over 50 percent higher than the average income of a physician operating a small Medicaid practice when the latter should be receiving higher fees. Clearly, LMP physicians at the tail of the income distribution are either much more productive than the average physician, receiving unusually high fees, generating a much larger number of profitable ancillary services, or cutting costs inappropriately. Is this subset of all LMPs the Medicaid mills so often maligned in Congressional testimony?* A separate analysis of these practices may shed further light on the behavior of LMPs and the need for specific public action.

### Descriptive Findings

Table VIII-1 compares the credentials and training of HILMP physicians with those in other LMPs and SMPs. Compared to their colleagues, HILMP physicians are older, much more likely to be foreign trained, less often board certified, but surprisingly more specialized. Whereas 40 percent of SMP physicians are general practitioners, only 13.6 percent of HILMPs do not specialize. General surgeons and internists are especially prominent. This could explain why this group enjoys relatively high incomes, but why are these specialists such heavy participants in the Medicaid program? Is it because they are foreign trained and are being squeezed out of the primary specialist market dominated by U.S.-trained specialists? Is it because they are older, or because many are nonwhite and housing discrimination prevents them from establishing more lucrative practices in the suburbs? We don't know.

HILMP specialists certainly are productive. Most specialists see less patients per week, yet the HILMP specialist-dominated group sees 15 percent more (Table VIII-2). Adjusting for specialty mix, HILMP physicians see 33 percent more patients than SMP physicians (206/155). Most of the extra visits come in the hospital which is consistent with the HILMP specialty mix. Yet, given the relatively large number of general surgeons among HILMPs, it is interesting that the group as a whole does not perform a significantly greater amount of surgery. Is it because many of these surgeons are older, or FMG, or non-board-certified, experiencing limited access to the operating room by their younger, better trained colleagues?

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*Identifying Medicaid mills by net incomes produces some unknown amount of classification error. Senator Moss (1979) has noted that many physicians practicing in LMPs may be particularly susceptible to an arrangement which allows them to earn an income greater than they otherwise could, with most of the extraordinary returns going to the owners of the practice (invariably missing from surveys such as ours). Some LMP physicians may not be reporting unusually high incomes, but in fact may be working in Medicaid mills.

TABLE VIII-1 :

## PHYSICIAN CREDENTIALS AND TRAINING: HILMPs VS. SMPs AND LMPs

| Medicaid Practice Size / Credentials | SMPs | LMPs | HILMPs |
|---|---|---|---|
| General Practitioner | 39.9% | 41.8% | 13.6%*** |
| General Surgeon | 21.2 | 16.7 | 40.3*** |
| Internist | 20.1 | 22.8 | 31.8* |
| OB-GYN | 9.9 | 8.3 | 8.9 |
| Pediatrician | 7.6 | 10.5 | 5.4 |
| Total | 100% | 100% | 100% |
| Foreign Medical Graduate | 12.2 | 20.6 | 22.9* |
| Third World FMG | 4.8 | 8.9 | 18.0** |
| Board-Certification | 42.8 | 28.6 | 36.8 |
| Sixty Years or Older | 28.8 | 33.7 | 43.1** |
| No Hospital Affiliation | 1.5 | 2.8 | 2.5 |

TABLE VIII-2 :

## PHYSICIAN CASELOAD AND WORK EFFORT, HILMPs VS. SMPs AND LMPs

| Caseload and Work Effort | SMPs | LMPs | HILMPs | HILMP (Specialty Adjusted)[a] |
|---|---|---|---|---|
| Length of Office Visit (minutes) | 19.6 | 18.8 | 16.2*** | 21.4 |
| Total Patient Care Hours | 51.5 | 52.6 | 52.2 | |
| Total Visits | 169.2 | 190.5 | 206.2** | 155 |
| Office Visits | 102.8 | 130.7 | 116.2 | 82.0 |
| Inpatient Visits | 49.2 | 42.0 | 59.6 | |
| Operations | 3.2 | 2.9 | 4.0 | |
| Emergency Room/ Clinic Visits | 9.3 | 11.2 | 19.1** | 10.0 |
| Nursing Home Visits | 2.6 | 5.1 | 3.2 | |
| House Calls | 1.1 | 1.1 | 0.4*** | |

[a] Adjusted for specialty mix differences by weighting the HILMP specialty mix by average weekly visits by specialty for the entire sample.

HILMP physicians are not working any harder (less than an hour more) generating the extra visits. Part of the reason may be the higher percentage of ER and inpatient visits which usually require less time, but certainly visit mix could not explain such a large difference in productivity. Besides, HILMP physicians not only spend less time per patient visit overall, but 3.5 minutes less in their office as well. After adjusting for specialty mix, HILMP office visits are over 5 minutes shorter, a full 20 percent lower than would have been predicted given SMP specialty mix and average visit lengths. One explanation for the unusual visit activity is that HILMP specialists are behaving more like general practitioners, treating a relatively simple casemix and referring time-consuming cases to other specialists. Barring this, HILMPs may be considered Medicaid mills delivering assembly-line care.

HILMPs use a somewhat different input mix in producing their higher caseload. Total FTEs in HILMPs are slightly higher (2.3 vs. 2.1 in SMPs) as are the number of clerks (1.5 vs. 1.2 in SMPs); RN inputs are significantly lower, on the other hand (0.1 vs. 0.3 in SMPs). Clerks may be needed for the extra paperwork involved in billing and collection from Medicaid and a lower income, less insured private clientele. The greater use of clerks might be expected to release HILMP physicians from administrative matters, thus their limited time spent with patients remains unexplained. Without this administrative support, visit lengths may well have been even shorter. Substituting auxillary medical personnel for HILMP physician time does not provide an answer, either, as RN, LPN, and Nurse Practitioner time was less in HILMPs than in SMPs.

An examination of ancillary testing, injections, and surgery does not generally distinguish HILMPs from other Medicaid practices with a few interesting exceptions. Laboratory testing* and x-ray procedures showed no significant differences, but HILMP internists reported a much higher percentage of injections and surgery. SMP internists recommended injections for only 16 percent of their patients versus a 42 percent rate in HILMPs; the corresponding figures from surgery were 1.2 percent and 10.5 percent. The high percentage of injections could be a casemix difference if HILMP internists were treating more children, but this does not explain the significantly smaller percentage of injections reported by HILMP pediatricians. The unusually high percentage of internist surgery in HILMPs cannot be due to a casemix effect, either, as HILMP surgeons report less surgery relative to their SMP colleagues. But with the notable exception of these internists, no important reported excesses in ancillary usage can be attributed to HILMPs.

HILMPs are not geographically distributed like either SMPs or LMPs (see Table VIII-3). Over 60 percent of the HILMPs are located in the South versus only 27.2 and 21.2 percent of SMPs and LMPs respectively. Very few HILMPs are located in the industrial Northeast with its large cities and extensive Medicaid programs. Fifty percent of HILMPs are located in small metropolitan areas with low Medicaid populations compared to only a third of SMPs and other LMPs. Another 13 percent are found in low Medicaid, rural areas. Certainly, these latter are not the popularly perceived Medicaid mills, but rather, older, less trained physicians apparently filling the gap left by physicians choosing not to participate in the program (28 percent of Southern physicians chose not to participate).

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*HILMPs did report internalizing ancillary services more often (81 vs. 74 percent in SMPs), but the difference was not statistically significant.

TABLE VIII-3:

## PRACTICE LOCATION, SIZE, AND ORGANIZATION
## BY SMP, LMP, AND HILMP

| | SMPs | LMPs | HILMPs |
|---|---|---|---|
| LOCATION | | | |
| North East | 29.3 | 27.1 | 4.3 |
| North Central | 23.3 | 14.4 | 10.9 |
| South | 27.5 | 21.2 | 60.8 |
| West | 19.9 | 37.4 | 24.0 |
| | 100.0% | 100.0% | 100.0% |
| Large Metropolitan | 37.8% | 39.3% | 18.3 |
| High Medicaid | 5.1% | 5.6 | 6.7 |
| Low Medicaid | 32.7 | 33.7 | 11.6 |
| Small Metropolitan | 38.1 | 38.5 | 58.3 |
| High Medicaid | 5.3 | 4.8 | 8.3 |
| Low Mediciad | 32.8 | 33.7 | 50.0 |
| Non-Metropolitan | 24.0 | 22.1 | 23.4 |
| High Medicaid | 4.2 | 8.8 | 10.0 |
| Low Medicaid | 19.8 | 13.3 | 13.4 |
| | 100.0% | 100.0% | 100.0% |
| | 100.0% | 100.0% | 100.0% |
| SIZE | | | |
| Solo | 61.6 | 80.8 | 69.1 |
| 2 - 5 MDs | 32.0 | 16.2 | 24.6 |
| 6 - 9 MDs | 3.8 | 2.0 | 3.8 |
| Prepaid | 2.5 | 0.9 | 2.5 |
| | 100.0% | 100.0% | 100.0% |
| ORGANIZATION | | | |
| MD Employees (mean) | 0.18 | 0.28 | 0.19 |
| Incorporation | 46.2% | 29.9% | 39.7% |

HILMP size and organization also are interesting, not because of any major differences but because they are so much like SMPs. Most HILMP physicians are in solo practice or small groups like their SMP colleagues. Slightly fewer are incorporated, again surprising given the tax advantages to incorporation which should be attractice to high income physicians. Nor do HILMPs hire more physician employees which might characterize a Medicaid mill in the usual sense.

HILMPs were originally identified by their conspicuous incomes (greater than $80,000, COL adjusted). Thus it is not surprising that net incomes in this group are $36,000 higher on average than in SMPs ($96,447 vs. $60,571; see Table VIII-4). HILMP incomes ranged from $101,453 for general practitioners to $92,592 for pediatricians. As physician hours do not vary between groups, the inputed hourly wage varies directly with income ($37.50 in HILMPs, $24.40 in SMPs). This difference is consistent across all specialties although insignificant for OB-GYNs.

High hourly wages may be due either to strong exogenous demand or superior background and training. While HILMP physicians do not have exceptional credentials, it is possible that exogenous factors might explain their exceptional net returns. The residuals from the hourly wage equation presented earlier were grouped by SMP, HILMP and compared. The (standardized) residual for 60 HILMPs was 0.68 compared to -0.009 for SMP physicians, a highly significant difference (F = 49). Holding demand, physician competition, and credentials constant, HILMP physicians still earn significantly more than physicians with only a small Medicaid patient load, despite the fact that HILMP physicians receive lower fees for the majority of patient visits.

HILMP physicians as a group, although not putting in any more patient care hours, generate many more visits and enjoy much higher incomes than their peers in SMPs. Heavier caseloads only explain part of their higher incomes, however, the remainder is due to higher markups. Table VIII-5 presents gross revenues, costs, and markups for HILMPs and SMPs. Gross revenues per visit are clearly much higher in HILMPs ($4.70 higher). Costs, on the other hand, are slightly lower, further adding to the markup differential of $6.26 ($16.46 vs. $11.19).

Part of the higher markup is evidently due to higher usual and Medicaid fees for office visits. HILMP physicians report usual office visit fees of $16.30 vs. $13.74 reported in SMPs while Medicaid fees are $10.51 and $8.44, respectively. These patterns remain within specialty. If SMP physicians participated in Medicaid at the same level as HILMP physicians (approximately 40 percent Medicaid), they would average 20 percent less per office visit because of lower usual and Medicaid fees. This difference would vary by specialty, but in all cases higher usual fees, higher Medicaid fees, or both contribute to higher gross revenues for HILMPs.

Why do HILMP physicians have higher usual fees than SMP physicians if they are older and less credentialed? The answer lies with the more generous Medicaid fees. With higher Medicaid fees, private marginal revenues (approximated by usual fees) do not fall as far before Medicaid participation begins. If HILMPs faced lower Medicaid fees, theory predicts they would see more, lower paying private patients before entering the program, thereby lowering the physician's average fee for an office

TABLE VIII-4:

INCOMES AND IMPUTED HOURLY WAGES OF HILMP AND SMP PHYSICIANS

| | SMPs | LMPs | HILMPs |
|---|---|---|---|
| Net Income - All | $60,571 | $57,007 | $96,447* |
| (Wage) | ($ 24.40) | ($ 21.93) | ($ 37.49)* |
| General Practitioners | 56,839 | 50,719 | 101,453*** |
| | ( 22.21) | ( 19.46) | ( 37.17)** |
| General Surgeons | 68,792 | 66,387 | 94,579*** |
| | ( 27.78) | ( 29.10) | ( 39.44)** |
| Internists | 60,284 | 60,555 | 97,380*** |
| | ( 24.50) | ( 26.54) | ( 35.58)*** |
| OB-GYNs | 66,697 | 68,292 | 96,264*** |
| | ( 27.27) | ( 29.24) | ( 36.18) |
| Pediatricians | 50,825 | 52,349 | 92,592*** |
| | ( 22.69) | ( 23.31) | ( 37.58)*** |

TABLE VIII-5 :

GROSS REVENUES AND COSTS PER VISIT, MARKUPS AND FEES
BY SPECIALTY, SMPs AND HILMPs

| Specialty/Type of Practice | Gross Revenues per Visit | Cost per Visit | Average Markup | Usual Office Fee | Medicaid Office Fee |
|---|---|---|---|---|---|
| General Practitioner | | | | | |
| SMP | $14.13 | $ 5.38 | $ 8.76 | $11.82 | $ 7.71 |
| HILMP | 11.27 | 3.56 | 7.71 | 11.60 | 8.60 |
| General Surgeon | | | | | |
| SMP | 20.96 | 6.22 | 14.74 | 14.65 | 8.21 |
| HILMP | 22.88 | 5.52 | 17.35 | 16.76 | 9.95 |
| Internist | | | | | |
| SMP | 18.46 | 6.40 | 12.01 | 15.98 | 9.53 |
| HILMP | 25.47 | 5.55 | 19.93 | 18.16 | 10.87 |
| OB-GYN | | | | | |
| SMP | 23.65 | 8.34 | 14.91 | 16.13 | 9.72 |
| HILMP | 25.02 | 6.73 | 18.29 | 17.88 | 14.15 |
| Pediatrician | | | | | |
| SMP | 11.79 | 4.50 | 7.29 | 12.04 | 8.20 |
| HILMP | 14.61 | 6.63 | 7.98 | 11.11 | 12.63 |
| Total | | | | | |
| SMP | 17.18 | 5.99 | 11.19 | 13.74 | 8.44 |
| HILMP | 21.88 | 5.42 | 16.46 | 16.30 | 10.51 |

visit. Thus, higher Medicaid fees not only insure greater participation but would raise the returns per visit on private patients, resulting in higher gross revenues per visit from all sources. Expanding the number of Medicaid eligibles should not affect usual fees unless a physician had already exhausted his pool of eligible patients and started seeing lower (than Medicaid) paying patients. Hence, part of the high markups enjoyed by HILMPs can be simply attributed to significantly higher Medicaid fees received. While other LMP physicians also report receiving higher Medicaid fees, encouraging participation, they are not nearly as high as those received by HILMPs ($10.51 per office visit for HILMPs vs. only $8.83 in LMPs and $7.46 in ELMPs).

Why do HILMPs receive such high Medicaid fees? The answer undoubtedly lies with their location. Sixty percent of HILMPs are in the South where only one state, Mississippi, establishes a fixed fee schedule for reimbursing physicians. The rest either follow Medicare UCR procedures exactly or employ some modification of UCR which is noted as a generous reimbursement procedure.

Higher office fees, however, only explain part of the higher markups received by HILMPs; the rest must be attributable either to more extensive non-office activities (e.g., surgery, hospital visits) or extra ancillary charges. Surgeons, for example, derive a significant part of their incomes from operations of various kinds. This would have the effect of raising average fees per visit, when visits include operations. HILMP physicians may be receiving higher gross revenues per visit because of a larger percentage of higher paying visits. For example, the high surgery rates of HILMP internists may explain why their markups are over $7.00 higher than SMP internists (see Table VIII-5). Alternatively, HILMP physicians may be recommending more ancillary services although self-reported data shown earlier does not support such a conclusion. Without more information on procedures, fees, and ancillaries, it is impossible to completely decompose markups. The most we can say is that (a) higher Medicaid fees explain a significant part of the markup differential, and (b) some unknown but significant variation remains to be explained by procedure mix and internal provision of extra ancillary services.

### Discriminant Analysis of HILMPs, LMPs, and HISMPs

HILMP physicians certainly earn more than other physicians serving large Medicaid populations, but do they differ in significant ways that might impact on the quality of care? That is, using the same set of process, training, and credentials variables used earlier to compare LMPs, ELMPs, and SMPs, can we discriminate between HILMPs and LMPs in general? Furthermore, do SMPs and HILMPs fall into distinct categories in terms of these variables?

To answer these questions, discriminant analysis was applied in two ways. First, HILMPs were contrasted with all other LMPs and ELMPs with net incomes less than $80,000 using process, training, and credentials as discriminating variables. (Physician imputed hourly wage is dropped from this comparison as HILMPs have been selected out more-or-less because of a priori differences in hourly wages.) A second contrast is made between HILMPs and High Income Small Medicaid Practices (HISMPs). The high income subset rather than all SMPs is used as a more rigorous test of unusual behavior in HILMPs. Presumably all high income practices, whether they be SMPs or LMPs, are bound to be different along key practice dimensions (e.g., high income physicians are more likely to be specialists with greater human capital investments). What is most interesting is whether HILMP physician behavior and training are significantly different from that of high income physicians generally. Here, a comparison of imputed wages would be appropriate as both groups earn extraordinary incomes; one group may simply earn more than the other.

Table VIII-6 presents variable means and discriminant function coefficients for the 15 discriminating variables defined earlier (general practitioners are the excluded specialty). The first column of coefficients pertains to the HILMP/LMP comparison, while the second to the HILMP/HISMP comparison. The class of HILMPs clearly differs from all other LMPs along many key dimensions. They spend less time with patients (LOV), recommend more x-rays and surgery, and tend to be more specialized, foreign trained, and lack hospital affiliations. LMPs on the other hand, recommend more injections. Insignificant variables included laboratory testing, use of aides, board-certification, physician age, and OB-GYN specialty. That HILMPs are more specialized than other LMPs is not surprising: specialists generally enjoy higher incomes. That they perform more surgery is also quite expected. The fact that they spend less time with patients in their offices, however, is inconsistent with the longer visit lengths of specialists generally (Reinhardt, 1975, p. 78, 82).

HILMP physicians clearly differ from other physicians seeing large numbers of Medicaid patients, but do they differ from high income physicians overall? The second discriminant function suggests that they do, but only in their credentials, age, and training and not in the kinds of services delivered or the hourly wages they receive. HILMP physicians are less often certified although more specialized, more likely to be foreign trained and much older. The only significant process difference was the greater number of x-rays recommended by HILMPs. Almost one in five HILMP physicians is foreign trained vs. only one in thirty HISMP physicians. One in three HILMP physicians is an internist; only one in eight HISMP physicians is similarly trained. Furthermore, two in five HILMP physicians are over sixty years of age while only one in five HISMP physicians are as old.

## Conclusions

Are HILMP physicians operating Medicaid mills? They definitely are earning more money than the average physician, both in total and per hour worked. This is true even after adjusting for specialty and training. But simply earning more is not the sine qua non of a Medicaid mill. A considerable part of their greater earning power is explained by the higher Medicaid fees they enjoy. On the other hand, HILMP physicians do spend less time with patients, but so do HISMP physicians. If short visit lengths are a sign of mills, then there must be Blue Shield and Medicare "mills" being run by other, high income physicians.

TABLE VIII-6:

## DISCRIMINANT ANALYSIS OF HILMPs, LMPs, AND HISMPs

| Variables | Discriminant Functions | | Means | | |
|---|---|---|---|---|---|
| Variables | HILMP/LMPs | HILMP/HISMP | HILMP | LMP | HISMP |
| MD WAGE | --- | a | 37.49 | --- | 38.56 |
| LOV | 0.46*** | a | 0.27 | 0.31 | 0.26 |
| TEST | a | a | 36.50 | 37.25 | 36.42 |
| SHOT | 0.78*** | a | 21.14 | 31.32 | 18.02 |
| XRAY | -0.27* | -0.25* | 21.65 | 14.56 | 13.81 |
| SURG | -0.55*** | -0.17 | 7.23 | 3.23 | 7.98 |
| AIDE | a | | 2.34 | 2.56 | 2.50 |
| BOARD | a | 0.63*** | 0.37 | 0.25 | 0.48 |
| FMG | -0.26** | -0.33** | 0.18 | 0.09 | 0.03 |
| MDAGE | -0.18 | -0.27* | 0.43 | 0.35 | 0.20 |
| HOSAFIL | -0.20* | a | 0.02 | 0.03 | 0.02 |
| GS | -0.50*** | -0.90*** | 0.40 | 0.14 | 0.33 |
| IM | -0.57*** | -0.75*** | 0.32 | 0.24 | 0.12 |
| OB | a | -0.37** | 0.09 | 0.07 | 0.14 |
| PED | -0.27*** | -0.29* | 0.06 | 0.09 | 0.05 |
| | $\lambda = 0.78^b$ | $\lambda = 0.84^b$ | | | |
| | $R_c = 0.46$ | $R_c = 0.40$ | | | |

[a] F-ratio insufficient for entry

[b] Associated Chi-square statistic significant at 1 percent level

[*] F-ratio significant at 10 percent level

[**] F-ratio significant at 5 percent level

[***] F-ratio significant at 1 percent level

What is particularly fascinating are the clear differences in HILMP age, background, and training. It is as if two separate markets exist, one for younger,well trained U.S. physicians; another for older less trained FMGs. Both are able to enjoy high incomes under certain circumstances if they are willing to work very hard in their office and in the hospital, if they specialize, and if private payors or Medicaid programs are generous. Of the three types of LMP participants, HILMP physicians (mostly surgeons and internists) appear to be more accidental than altruistic or avaricious. Because of circumstances, most are acting more like general practitioners, seeing more patients in more settings, probably filling the void created by the scarcity of younger, better trained domestic physicians. For their effort they earn an hourly wage comparable to other high income physicians, yet above their own credentials and training. A more equal participation rate of younger domestic physicians would presumably reduce both the Medicaid caseloads and incomes of HILMPs through increased competition; either that, or force them to alter their practice style in ways detrimental to patient care.

## IX ANALYSIS OF SECONDARY SPECIALISTS

The size distribution of Medicaid practices varies considerably across the three groups of secondary specialists; LMPs constitute 9.1 percent, 13.6 percent, and 8.4 percent of medical specialist, surgical specialist, and psychiatrist practices, respectively. How do these LMPs differ from SMPs run by secondary specialists? Given their relative scarcity, for example, might we expect medical LMPs to be more suspect than surgical LMPs, i.e., to have more "mill"-like characteristics? To what extent do these LMPs resemble those operated by primary care physicians?

### Geographic Location

Large Medicaid practices have usually been considered an inner-city phenomenon. We observed earlier, however, that primary care LMPs are located disproportionately in small metropolitan and non-metropolitan areas. Secondary specialists in general will tend to congregate in larger cities, where they can be near facilities and colleagues, but it is possible that specialist LMPs may follow the primary care pattern. Table IX-1 presents the Medicaid size distribution of the three subspecialist groups across large (greater than 1.4 million population), small, and non-metropolitan areas, and across high and low Medicaid population areas. Medical specialist LMPs are more likely to be located in small metropolitan areas compared with SMPs, with very few in rural areas (5.5% versus 11.6 % for SMPs). By contrast, over one-half of surgical specialist LMPs are found in the largest metropolitan areas. Like the primary care LMPs, the surgical and medical specialist LMPs are more likely to be located in areas with high Medicaid populations, where they would naturally have a large patient pool to draw from.

Fully one-quarter of psychiatrist LMPs are located in non-metropolitan areas, compared with only 1.5 percent of the SMPs. This is particularly noteworthy, for psychiatrists are one of the least evenly distributed specialties (Morrow, 1977). These LMPs may be the only source of ambulatory psychiatric care in those rural areas, and thus treat all Medicaid patients. By contrast, there are very few LMPs, but many SMPs in high Medicaid, large metropolitan areas (3.4% compared with 21.7% of SMPs), suggesting that higher psychiatrist-population ratios tend to spread the Medicaid patient load somewhat more evenly.

### Physician Incomes

A major concern of policy makers has been that LMP physicians may earn inordinately high incomes. Table IX-2 presents net incomes and imputed hourly wages for each of the secondary specialties by Medicaid practice size. Analysis of primary care physicians in the Chapter VI found that LMP physicians earned as much as, and sometimes less than, their SMP peers. After adjustment for hours worked, all primary care physicians with LMPs earned significantly less on average. Findings for the secondary specialists are quite similar. Psychiatrists, all surgical specialists, allergists, and gastroenterologists with large Medicaid practices enjoy the same net incomes as do their colleagues. LMP cardiologists, on the other hand, earn only one-half as much as their colleagues with smaller Medicaid practices. Most striking, however, are the unusually high incomes enjoyed by dermatologists in large Medicaid practices;

TABLE IX-1:

## GEOGRAPHIC LOCATION BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

| Specialty Group | Medical Specialists | | | Surgical Specialists | | | Psychiatrists | | |
|---|---|---|---|---|---|---|---|---|---|
| Medicaid Practice Size / Location | None | Small | Large | None | Small | Large | None | Small | Large |
| Large Metropolitan: | 55.8% | 45.1% | 43.5% | 54.1% | 36.6% | 51.9% | 72.9% | 53.1% | 46.0% |
| High Medicaid | 24.4 | 5.6 | 11.4 | 15.3 | 3.7 | 5.9 | 27.4 | 21.7 | 3.4 |
| Low Medicaid | 31.3 | 39.6 | 32.1 | 39.8 | 33.0 | 46.0 | 45.6 | 31.5 | 42.8 |
| Small Metropolitan: | 25.2 | 43.3 | 50.9 | 33.6 | 48.6 | 37.2 | 22.9 | 45.3 | 28.8 |
| High Medicaid | 0.2 | 2.8 | 8.9 | 1.5 | 2.9 | 13.9 | 0.1 | 4.1 | 6.8 |
| Low Medicaid | 25.0 | 40.5 | 42.0 | 32.1 | 45.7 | 23.4 | 22.8 | 41.1 | 22.0 |
| Non-Metropolitan: | 19.1 | 11.6 | 5.5 | 11.4 | 14.7 | 10.8 | 4.1 | 1.5 | 25.1 |
| High Medicaid | 0.0 | 3.5 | 0.0 | 0.0 | 0.8 | 0.7 | 0.2 | 0.0 | 8.3 |
| Low Medicaid | 19.1 | 8.0 | 5.5 | 11.4 | 13.9 | 10.1 | 3.9 | 1.5 | 16.8 |

NOTE: All columns sum to 100%.

TABLE IX-2:

### NET INCOMES AND IMPUTED HOURLY WAGES[a] BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

| Specialty Group \ Medicaid Practice Size | Total | None | Small | Large |
|---|---|---|---|---|
| **Medical Specialists:** | | | | |
| Allergists | $48,506<br>(26.39) | $34,301<br>(17.20) | $62,921<br>(31.12) | $48,297<br>(23.14) |
| Cardiologists | 64,883<br>(29.70) | 62,118<br>(24.66) | 87,812<br>(34.53) | 44,720***<br>(18.35)** |
| Dermatologists | 66,161<br>(34.52) | 59,833<br>(32.90) | 63,828<br>(34.06) | 74,821 *<br>(39.58)* |
| Gastroenterologists | 71,913<br>(31.58) | 70,359<br>(28.88) | 73,369<br>(32.30) | 72,011<br>(35.61) |
| All | 65,297 | 56,083<br>(25.91) | 74,124<br>(33.42) | 65,682<br>(33.14) |
| **Surgical Specialists:** | | | | |
| Neurosurgeons | $78,358<br>(34.20) | $74,632<br>(34.36) | $79,345<br>(34.60) | $81,098<br>(34.12) |
| Opthalmologists | 57,799<br>(28.00) | 55,113<br>(26.25) | 61,001<br>(28.79) | 57,284<br>(26.85) |
| Orthopedic Surgeons | 74,052<br>(34.83) | 66,710<br>(32.09) | 79,996<br>(36.97) | 75,449<br>(26.13)*** |
| Otolaryngologists | 59,951<br>(28.87) | 52,365<br>(23.43) | 64,887<br>(28.91) | 62,602<br>(27.97) |
| Urologists | 67,851<br>(31.08) | 70,298<br>(27.95) | 71,866<br>(33.11) | 61,390<br>(25.54)** |
| All | 65,609 | 63,315<br>(29.82) | 70,327<br>(32.38) | 63,860**<br>(27.02)*** |
| **Psychiatrists** | $48,288<br>(25.46) | $48,409<br>(24.41) | $50,703<br>(26.71) | $45,751<br>(23.37) |

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[a] Adjusted for cost-of-living.

they earn 17 percent more on average than do those in SMPs.

After adjustment for hours worked, we observe that some of these differences still persist. LMP cardiologists continue to earn significantly less than their SMP peers, and LMP dermatologists significantly more. Imputed hourly wages for urologists and orthopedic surgeons in large Medicaid practices are also lower, when compared with their SMP colleagues.

In sum, the majority of specialists in LMPs do not enjoy higher incomes, and some earn significantly less, especially when variations in work effort are held constant. The sole exceptions are the dermatologists who appear to profit considerably by operating large Medicaid practices.

## Physician Credentials

Large Medicaid practices have often been characterized in the literature as being managed by physicians with relatively less training. We observed earlier that LMP primary care physicians generally had fewer credentials than did SMP physicians. It seems reasonable to expect that this is also true of the secondary specialists.

Table IX-3 compares specialty and physician credentials across the Medicaid practice size groups. As all physicians in this analysis are subspecialists already, specialty type cannot be considered a credential. Nevertheless, the dominance of any specialty in the Medicaid market may be informative in its own right. LMPs include a significantly lower proportion of cardiologists and orthopedic surgeons. One possible explanation is that average Medicaid reimbursement levels are particularly low for these two physician fields. These are two of the same three subspecialties found to enjoy lower hourly earnings in large Medicaid practices. The predominance of dermatologists in the Medicaid market is striking; well over one-half (59.7%) of all medical specialist LMPs are operated by dermatologists. This is puzzling, as a number of Medicaid programs insist that physician visits be medically necessary; yet the majority of visits to dermatologists' offices are deemed non-serious (NCHS, 1978d). Perhaps, these LMP dermatologists treat a more seriously ill patient population, e.g., those with skin neoplasms.

With a few exceptions, LMPs in each of the three subspecialty groups are as well trained and as well qualified as their colleagues in smaller Medicaid practices. There are no differences in the proportion of physicians who are board-certified, for example. Surgical specialists with large Medicaid practices are almost three times as likely to be foreign medical graduates than are their SMP peers, 17.5 percent versus 6.2 percent. Using the more restrictive definition of Third World FMG, surgical specialists with LMPs are still significantly more likely to be trained outside the U.S. By contrast, there are no differences in FMG status within the medical specialist or psychiatrist groups, except for LMP medical specialists who are actually less likely to be Third World FMGs.

Physicians with large Medicaid practices have been described as older and less likely to have hospital admitting privileges, characteristics which may suggest poor quality of care. We observed earlier that primary care physicians with extra large Medicaid practices (but not those with practices 30-50% Medicaid) did, in fact, share these characteristics. Secondary specialists, on the other hand, do not. There are no differences in the proportions of physicians aged 60 years or older across Medicaid practice sizes. A higher proportion of

TABLE IX-3:

## SPECIALTY AND PHYSICIAN CREDENTIALS BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

| Specialty Group | Medical Specialists | | | Surgical Specialists | | | Psychiatrists | | |
|---|---|---|---|---|---|---|---|---|---|
| Medicaid Practice Size / Credential | None | Small | Large | None | Small | Large | None | Small | Large |
| Specialty: | | | | | | | | | |
| Allergy | 21.1 | 16.2 | 8.9 | ---- | ----- | ----- | ---- | ----- | ----- |
| Cardiology | 47.2 | 36.7 | 21.7** | ---- | ----- | ----- | ---- | ----- | ----- |
| Dermatology | 25.4 | 29.9 | 59.7*** | ---- | ----- | ----- | ---- | ----- | ----- |
| Gastroenterology | 6.3 | 17.2 | 9.9 | ---- | ----- | ----- | ---- | ----- | ----- |
| Neurosurgery | ---- | ----- | ----- | 8.5 | 7.4 | 5.3 | ---- | ----- | ----- |
| Opthalmology | ---- | ----- | ----- | 25.5 | 32.7 | 34.1 | ---- | ----- | ----- |
| Orthopedic Surgery | ---- | ----- | ----- | 36.8 | 28.8 | 18.4** | ---- | ----- | ----- |
| Otolaryngology | ---- | ----- | ----- | 11.3 | 12.4 | 19.2 | ---- | ----- | ----- |
| Urology | ---- | ----- | ----- | 17.9 | 18.8 | 22.9 | ---- | ----- | ----- |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | ---- | ----- | ----- |
| Board Certification | 46.2 | 64.5 | 61.3 | 68.5 | 72.8 | 58.4 *** | 43.0 | 48.6 | 40.4 |
| Foreign Medical Graduate (FMG) | 9.8 | 11.9 | 9.5 | 2.6 | 6.2 | 17.5*** | 6.7 | 14.3 | 15.4 |
| Third World FMG | 5.1 | 5.9 | 0.4*** | 1.7 | 2.3 | 4.5*** | 5.0 | 3.7 | 3.3 |
| Sixty Years or Older | 34.8 | 21.0 | 29.5 | 39.7 | 18.3 | 19.9 | 14.1 | 14.9 | 14.7 |
| No Hospital Affiliation | 8.3 | 7.3 | 10.6 | 1.9 | 2.0 | 0.3** | 33.7 | 24.9 | 7.7*** |

surgical specialists and psychiatrists with LMPs, furthermore, have hospital privileges than do SMP physicians.* The strong hospital association of LMP psychiatrists is particularly interesting; they are 23 percent more likely to be affiliated with a hospital than are psychiatrists with small Medicaid practices. This difference can probably be attributed to Medicaid reimbursement policies and a subsequent shift in casemix in the large Medicaid practices. Coverage of ambulatory mental health services tends to be very limited under Medicaid relative to inpatient psychiatric care (President's Commission on Mental Health, 1978). In particular, the long-term, individual psychotherapy traditionally practiced by psychiatrists is often not covered by state Medicaid programs (MMMI, 1979). Patients benefitting from this form of treatment generally suffer from neuroses and situational disturbances, diagnoses that account for one-half of all office visits to psychiatrists (NCHS, 1978e). As a result, psychiatrists with large Medicaid practices may be treating a sicker population, i.e., those who are more likely to require hospitalization.

### Caseload and Work Effort

Unusually high caseloads in large Medicaid practices have been a major concern of federal policymakers. Higher volume in these practices may indicate that physicians are providing more visits than medically necessary, or that Medicaid patients are receiving less of the physician's time. Earlier we found that primary care physicians in both large and extra-large Medicaid practices did see significantly more patients per week, primarily in their offices and in hospital clinics and emergency rooms. By contrast, medical and surgical specialists with large Medicaid practices have the same caseloads as their SMP colleagues (Table IX-4). (Due to differences in specialty mix between SMPs and LMPs, there is some variation by type of visit among the medical specialist group. Dermatologists, who dominate these LMPs, are less likely than other specialists to see hospital patients or make house calls.)

Psychiatrists with LMPs, however, do have a significantly higher practice volume; they see 35 percent more patients per week *in toto* than do other psychiatrists, and 44 percent more in their offices. Despite their larger caseload, LMP psychiatrists do not work longer hours, implying that trade-offs are made at the patient's expense. In fact, these psychiatrists do spend significantly less time with their office patients, only 49 minutes compared with a full hour for SMP psychiatrists.** Does this mean that patients in these large Medicaid practices are receiving lower quality care? On the surface, the answer would appear to be yes. There are two possible explanations, however, for the shorter visit lengths in large Medicaid psychiatric practices. First, if LMP psychiatrists are seeing a more seriously ill patient population (as suggested by their higher rate of hospital affiliation), they may be substituting drug therapy for psychotherapy. Such visits would necessarily be shorter. Second, LMP psychiatrists may be seeing more patients in group therapy, thereby lowering average lengths of visit, but not necessarily quality. Group sessions may be profitable in two ways: (1) even when Medicaid reimbursement rates are set lower for group than for individual sessions, several Medicaid patients

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*Virtually all surgical specialists have hospital affiliations. The larger number of SMPs without them, although statistically significant, is still too small to be meaningful.

**Other data sources suggest this latter mean is unusually high. A 1973 survey of private practice psychiatrists reported a mean office visit of 48 minutes (Marmor, 1975).

TABLE IX-4:

### CASELOAD AND WORK EFFORT BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

| Specialty Group | Medical Specialists | | | Surgical Specialists | | | Psychiatrists | | |
|---|---|---|---|---|---|---|---|---|---|
| Medicaid Practice Size / Work Effort | None | Small | Large | None | Small | Large | None | Small | Large |
| Length of Office Visit (minutes) | 54.9 | 23.7 | 21.2 | 23.0 | 20.6 | 22.9 | 65.3 | 60.4 | 48.6*** |
| Total Patient-Care Hours | 43.7 | 45.2 | 41.0** | 44.6 | 47.0 | 46.7 | 39.0 | 40.6 | 42.3 |
| Total Visits | 114.5 | 149.6 | 149.6 | 124.7 | 136.8 | 127.4 | 52.1 | 55.1 | 74.4* |
| Office Visits | 87.8 | 103.4 | 110.7 | 80.4 | 88.7 | 84.6 | 35.7 | 34.2 | 48.0* |
| Inpatient Visits | 20.0 | 38.8 | 25.2** | 33.9 | 35.5 | 30.7 | 10.2 | 17.1 | 22.8 |
| Operations | 1.6 | 1.6 | 0.6 | 4.8 | 5.6 | 5.3 | ---- | ---- | ---- |
| Emergency Room/ Clinic Visits | 3.7 | 4.6 | 10.2** | 4.8 | 6.1 | 5.9 | 2.6 | 2.7 | 0.5*** |
| Nursing Home Visits | 1.1 | 1.9 | 2.7 | 0.7 | 0.5 | 0.6 | 3.6 | 0.7 | 1.5 |
| House Calls | 0.5 | 0.5 | 0.2** | 0.1 | 0.1 | 0.3 | 0.1 | 0.3 | 1.7 |

together may yield higher net revenues than a single Medicaid patient; and (2) cross-subsidization can take place in a mixed group of private and public program patients. LMP psychiatrists may also have an altruistic reason for preferring group therapy. Several state Medicaid programs have a dollar (rather than visit) ceiling on outpatient mental health services; in these instances, weekly treatment sessions could be sustained over a longer time period.

In sum, the psychiatrists are the only specialist group of LMPs that resemble the primary care LMPs in their high caseloads. Office volume is high, and average visit length low, suggesting possible trade-offs with the quality of care. In the absence of more detailed information on casemix in these practices, however, it is difficult to know for sure.

## Ancillary Services, Inputs, and Practice Organization

### Ancillary Services

Excessive utilization of ancillary services in large Medicaid practices is one of the primary characteristics of a "mill". Evidence for primary care practices was ambiguous; patterns of increasing ancillary use were not monotonic with respect to size of Medicaid practice, and often were inconsistent across specialties. Tables IX-5, and IX-6 present ancillary utilization rates by Medicaid practice size for medical and surgical specialists, respectively. (These questions were not asked of psychiatrists.) Here again the results are ambiguous. For the most part, there are no differences in the frequency with which different ancillary procedures are ordered. There are three notable exceptions, however; LMPs run by cardiologists and urologists tend to have fewer ancillaries and those run by dermatologists, more. Cardiologists with large Medicaid practices order significantly fewer laboratory tests, fewer x-rays, and fewer office surgical procedures, than do SMP cardiologists. They order injections, however, for over one-half of all their office patients (56%), a rate four times that of SMPs. This high rate of injections is similar to that of LMP and ELMP internists, and suggests that either LMPs run by these two specialties treat a more serious casemix, or they are more adept at shifting demand. The case of dermatologists raises some serious policy concerns. Dermatologists with LMPs order more ancillary services of all types, and significantly more x-rays and office surgery . While it is possible that they are treating a sicker patient population, we have no way of knowing for sure. What we do know is that these LMP dermatologists also attain significantly higher net incomes than those with small Medicaid practices.

Urologists with LMPs present something of a puzzle. They use significantly fewer ancillary procedures of all types, than do SMP urologists, except injections which they order more frequently. We can only conclude that there are substantial, but unknown, casemix differences.

### Inputs

Primary care physicians with large and extra-large Medicaid practices were found to employ significantly more auxillary staff, particularly clerical and nursing personnel. Looking at Table IX-7, we observe that the opposite is true for subspecialists; medical and surgical specialists with LMPs use significantly fewer aides than SMP physicians. This is more striking in the case of medical specialists LMPs which employ fewer clerks, fewer RNs, and fewer technicians.

TABLE IX-5:

## ANCILLARY SERVICES BY SIZE OF MEDICAID PRACTICE: MEDICAL SPECIALISTS

| Service / Medicaid Practice Size | None | Small | Large |
|---|---|---|---|
| Laboratory Tests: | 46.7% | 37.9% | 20.1%*** |
| Allergists | 75.4 | 38.8 | 12.1*** |
| Cardiologists | 49.7 | 49.8 | 18.5*** |
| Dermatologists | 15.8 | 13.0 | 15.0 |
| Gastroenterologists | 49.7 | 54.9 | 61.3 |
| Injections: | 19.2 | 21.9 | 29.5 |
| Allergists | 34.6 | 72.7 | 48.5 |
| Cardiologists | 13.1 | 12.5 | 56.0*** |
| Dermatologists | 17.9 | 14.8 | 20.6 |
| Gastroenterologists | 18.2 | 6.4 | 8.5 |
| X-rays: | 19.7 | 15.3 | 9.6** |
| Allergists | 2.5 | 4.5 | 4.0 |
| Cardiologists | 36.6 | 22.0 | 9.9* |
| Dermatologists | 0.5 | 2.1 | 7.1** |
| Gastroenterologists | 29.2 | 33.9 | 29.4 |
| Office Surgery: | 9.2 | 8.8 | 23.5*** |
| Allergists | 0.1 | 0.2 | 0.8 |
| Cardiologists | 0.2 | 1.0 | 0.1** |
| Dermatologists | 35.2 | 25.5 | 38.9** |
| Gastroenterologists | 2.2 | 4.8 | 2.3 |

TABLE IX-6:

## ANCILLARY SERVICES BY SIZE OF MEDICAID PRACTICE: SURGICAL SPECIALISTS

| Medicaid Practice Size<br>Service | None | Small | Large |
|---|---|---|---|
| Laboratory Tests: | 20.1 | 22.6 | 23.7 |
| Neurosurgeons | 13.8 | 21.0 | 18.8 |
| Opthalmologists | 9.3 | 7.3 | 3.2*** |
| Orthopedic Surgeons | 17.3 | 8.2 | 14.7* |
| Otolaryngologists | 13.7 | 20.8 | 26.7 |
| Urologists | 45.4 | 74.4 | 59.9* |
| Injections: | 8.5 | 6.2 | 8.4 * |
| Neurosurgeons | 9.1 | 1.8 | 13.6*** |
| Opthalmologists | 4.0 | 1.4 | 0.5* |
| Orthopedic Surgeons | 9.1 | 11.6 | 14.6 |
| Otolaryngologists | 16.5 | 7.4 | 9.5 |
| Urologists | 3.5 | 3.6 | 12.4** |
| X-rays: | 22.2 | 22.2 | 19.1 |
| Neurosurgeons | 19.3 | 29.9 | 27.4 |
| Opthalmologists | 1.6 | 0.8 | 1.2 |
| Orthopedic Surgeons | 49.0 | 55.3 | 60.8 |
| Otolaryngologists | 7.9 | 10.7 | 18.3 |
| Urologists | 9.5 | 17.2 | 11.4** |
| Office Surgery: | 5.5 | 5.2 | 4.7 |
| Neurosurgeons | 6.5 | 1.2 | 0.3 |
| Opthalmologists | 2.9 | 2.6 | 2.9 |
| Orthopedic Surgeons | 4.9 | 4.0 | 4.5 |
| Otolaryngologists | 4.9 | 4.7 | 5.4 |
| Urologists | 11.1 | 14.1 | 8.1* |

TABLE IX-7:

### AUXILLARY STAFF BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

| Specialty Group | Medical Specialists | | | Surgical Specialists | | | Psychiatrists | | |
|---|---|---|---|---|---|---|---|---|---|
| Medicaid Practice Size / Staff | None | Small | Large | None | Small | Large | None | Small | Large |
| Total | 1.9 | 2.5 | 1.7*** | 1.7 | 2.3 | 2.0* | 0.5 | 0.6 | 1.0 |
| Clerks | 1.2 | 1.6 | 1.2** | 1.3 | 1.6 | 1.5 | 0.4 | 0.6 | 0.9 |
| RNs | 0.2 | 0.4 | 0.2*** | 0.1 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 |
| LPNs | 0.1 | 0.2 | 0.2 | 0.0 | 0.1 | 0.0*** | 0.0 | 0.0 | 0.0 |
| Technicians | 0.3 | 0.3 | 0.1*** | 0.2 | 0.2 | 0.2 | 0.0 | 0.0 | 0.0 |
| Nurse Practitioners | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 |

It appears that these LMPs may be skimping on non-physician labor inputs in order to lower practice costs (and thereby increase physician net revenues).

## Practice Size and Organization

Large Medicaid practices run by primary care physicians were typically solo and unincorporated practices, unlike the SMPs which were more likely to be incorporated groups. LMPs managed by medical specialists follow a similar pattern; they are disproportionately solo, unincorporated practices (Table IX-8). The organizational form of LMPs operated by surgical specialists and psychiatrists, however, resembles that of SMPs.

## Conclusions

LMP subspecialists more closely resemble their SMP colleagues than do primary care LMPs and do not appear to have Medicaid mill characteristics. These LMP physicians generally have comparable net incomes, are equally well trained, and have similar levels of work effort, caseload, and ancillary utilization. There are two important exceptions to this generalization, however. For one, LMP psychiatrists have higher practice volumes and shorter average visits but in the absence of casemix data, we cannot conclude for certain that they are providing lower quality. A more serious problem is presented by the LMP dermatologists. This specialty dominates the medical specialist LMP group, which in itself is somewhat surprising given the nonserious nature of most skin problems. More troubling to policy makers is the fact that LMP dermatologists earn 17 percent more than those in SMPs, without working any harder. Furthermore, they appear to have unusually high rates of ancillary utilization, significantly more x-rays and office surgical procedures. Although caseloads and credentials are comparable with those of other dermatologists, these high incomes and high ancillary use are strongly suggestive of a Medicaid mill. A detailed examination of the secondary specialists in general, and dermatologists in particular, was outside the scope of this project. These descriptive findings indicate, however, that such analysis be conducted in the future.

TABLE IX-8:

## PRACTICE ORGANIZATION BY SIZE OF MEDICAID PRACTICE: SECONDARY SPECIALISTS

| Specialty Group | Medical Specialists | | | Surgical Specialists | | | Psychiatrists | | |
|---|---|---|---|---|---|---|---|---|---|
| Medicaid Practice Size<br>Organization | None | Small | Large | None | Small | Large | None | Small | Large |
| Size: | | | | | | | | | |
| Solo | 55.8 | 55.1 | 74.8 | 62.9 | 50.8 | 51.1 | 95.4 | 90.0 | 86.4 |
| 2 - 5 MDs | 26.3 | 37.5 | 23.3 | 21.6 | 40.3 | 44.7 | 1.5 | 8.6 | 8.7 |
| 6 - 9 MDs | 17.5 | 5.6 | 1.5 | 12.5 | 4.3 | 0.6 | 2.3 | 0.8 | 1.0 |
| Prepaid | 0.3 | 1.9 | 0.4 | 3.0 | 4.1 | 3.6 | 0.8 | 0.5 | 3.9 |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| Incorporation | 41.2 | 56.4 | 42.0* | 43.0 | 62.7 | 64.4 | 26.3 | 35.6 | 37.3 |

## X. CONCLUSIONS AND POLICY IMPLICATIONS

### Conclusions

Exceptional cases of fraud and abuse in inner city large Medicaid practices have prompted an investigation of LMPs nationally. The large percentage of Medicaid patients in LMPs has reinforced concern over the quality of care in such settings. While practices with a majority of Medicaid patients are a distinct minority of all practices (only 5.5 percent), nearly 32 percent of all Medicaid patients receive care in these extra-large Medicaid practices. Furthermore, nearly 60 percent of all Medicaid patients receive care in practices at least 30 percent Medicaid, which constitute 15.5 percent of practices. Even if a small percent of these LMPs are mills, because Medicaid patients are so unequally distributed, a large number of patients will be affected by care received there.

As for large Medicaid practices altogether, there is no evidence that mills are a significant factor. Visit lengths are shorter in LMPs, but only a minute or two. Nor is there widespread abuse of ancillary services, skimping on auxiliary personnel, or excessive markups over costs. LMP physicians at best average what other physicians make; usually earnings are less. Contrary to the stereotype, most LMPs are not found in large, inner city ghettos, but rather, in small cities, in rural areas, and in the South.

The background and training of LMP physicians can be criticized, however; they tend to be older, less specialized, with fewer credentials (e.g., less often board-certified). A much higher percentage are trained in foreign medical schools. If our theory is correct that the Medicaid program and its beneficiaries constitute a secondary, residual market, subordinate to a better insured primary market, then competition will drive less qualified physicians into the Medicaid program in disproportionate numbers. A primary goal of the public benefits programs to integrate the poor into mainstream medicine is thereby thwarted. Many of the poor, of course, are receiving office-based care for the first time and access has thereby improved, but it is by no means equal. The Medicaid patient has a much higher probability than the Blue Shield or even the Medicare patient of being treated by a less qualified physician. Access to ambulatory physician care, whatever the background of the physician, may be better than no care at all (or institutional care), it may even be adequate, but it is not equal.

The circumstances underlying the origins of large Medicaid practices point to the invisible hand of competition and the decentralized administration of the Medicaid programs. A significant literature now exists describing the competitive behavior of physicians. Most do respond to demand in making work-leisure decisions, in organizing their practice, in selecting their patients, and even in choosing their specialty. The low fee schedules in many Medicaid programs, exacerbated by extensive payment delays, discourage qualified physicians from entering the Medicaid market; more lucrative opportunities exist elsewhere. Residential location decisions further separate the well-trained, high income physician from the poor inner city or rural patient. Hence the decision not to see Medicaid patients is often not even made, having been pre-empted by other, personal preferences.

A surfeit of physicians, however, can make the Medicaid program appear more attractive to some as competition for private patients squeezes out the marginal physician. To make a "decent" living, he may have to see a large number of the Medicaid poor. The maldistribution of physicians not only limits access, it fundamentally changes its character. Choice is strictly limited to either institutional care in an impersonal, crowded hospital emergency room or to somewhat less crowded, more personal care by an LMP physician lacking in training and credentials.

Physician time is a very scarce commodity. It currently goes for $20 - 25 per hour, $160 - 200 per day. Medicaid competes for access on behalf of its beneficiaries with other insurance programs and the uninsured through its fee schedules, scope of coverage and benefits. Higher fee schedules will encourage physicians to expand their Medicaid practices, they may even foster disreputable LMPs, but increased participation overall adds a competitive factor and expands patient choice. No adverse effects on the size distribution of Medicaid practices results from more generous fees, and total access certainly increases. Larger Medicaid programs without higher fees, on the other hand, definitely encourage LMPs. States like New York and California which limit physician fees but enroll a large percentage of the poor do improve access, but often not to mainstream medicine. Egalitarian notions of extending free care to the poor while constraining physician rewards may be laudable, but are only partially attainable under a private, fee-for-service mode of reimbursement in which most physicians have lucrative alternatives. The alternative of limited coverage and relatively high Medicaid fees (as in the South) may raise the qualifications of participating physicians without bankrupting the program, but overall access is jeopardized to some unknown extent. Political and personal prejudice may also restrict participation and frustrate attempts to extend high quality care to the poor through public benefits programs.

In sum, little is known of the impact of basic programmatic elements like fee schedules, eligibility definitions and benefits coverage, on the quantity and quality of physician services under Medicaid. We know that higher fee schedules increase participation and that broader coverage fosters large Medicaid practices, practices run by generally less qualified physicians. We know practically nothing about the welfare losses associated with limited coverage, nor are we very sure about the quality of care delivered in LMPs serving the majority of covered patients; visit lengths are a bit shorter, and training is below average, but care still may be adequate. What this says is that policy decisions governing key elements of the program may have undesirable side effects on the quantity and nature of access to office-based primary care. It also says that the success of program administration in acheiving better care will depend in crucial ways on the local distribution of the poor, the distribution of physicians, and the financial attractiveness of the private market. For example, if physician practices and the poor are fairly evenly distributed across the population, then higher Medicaid fees could significantly improve access without fostering undesirable kinds of LMPs (i.e., mills, poorly trained physicians). If, however, the poor are highly segregated (like many black urban ghettos), higher fees may only result in larger and larger LMPs.

While most LMP physicians earn less than the average physician, a few do earn considerably more, which seems paradoxical given lower Medicaid fees. Part of the difference is explained by specialty; high income LMPs tend to be specialists. Still, they earn considerably more per hour, adjusting for specialty, age, and credentials. Why? Primarily because of (a) more visits per hour and (b) much higher markups. Visit lengths are definitely shorter (on the average of five minutes after adjusting for specialty mix), and Medicaid and usual fees significantly higher than average. Most (60 percent) of the high income LMPs are in the South which is not so surprising given the generally higher incomes of Southern practitioners. Higher

Medicaid fees and average markups are also consistent with the bias in Southern Medicaid programs towards UCR reimbursement methods. In their caseloads and visit mix (office, hospital, nursing home), many high income LMP specialists function more like general practitioners, seeing more patients for shorter lengths of time, yet enjoying higher average fees because of their specialization. Welfare losses accrue either to patients not receiving the level of specialized attention their casemix requires or to taxpayers paying for unneeded specialist services.

In addition to primary care services, many Medicaid patients also have need for specialized medical, surgical, and psychiatric care. Fewer subspecialists concentrate on Medicaid patients which is expected given the narrow range of services provided. In terms of credentials, age, training, and quality of care, those that do concentrate are undifferentiable from those that do not, with the notable exception of dermatologists and psychiatrists. LMP dermatologists earn more money, in total and per hour worked, than those operating small Medicaid practices. They also show a more extensive use of ancillaries. LMP psychiatrists have a relatively greater caseload and shorter visit length although their incomes are not higher than their peers'. Provocative questions remain like why dermatologists specializing in Medicaid patients give more shots, take more x-rays, perform more office surgery? Why do psychiatrists spend less time with the poor when their psychological problems are probably more serious? Casemix effects may explain these differences, they may not. Given the elective nature of the services provided by these two groups, some justification is required for the appropriateness of the care being delivered.

## Policy Implications

Because of the Moss investigations, large Medicaid practices have been subject to a blanket criticism, essentially making serving the poor a disreputable occupation. Exposes may discourage illegal behavior but they may also have the unintended side effect of discouraging altruistic physicians from expanding their practices in underserved areas. Care should be taken in identifying fraud and abuse cases not to alienate the medical community at large through public indictments of large Medicaid practices *in toto*.

The structure and administration of Medicaid programs also affect the quantity and quality of patient access above and beyond fraud and abuse activities. Making Medicaid fees more competitive with other insurors definitely raises participation without adversely affecting small and large Medicaid practices. Reducing payment delays and streamlining overall administration could even have positive effects on the maldistribution of Medicaid patients if nonparticipants are more sensitive to billing-collection problems than LMPs (a likely situation).

Medicaid programs with generous benefits and eligibility criteria are bound to encourage LMPs. Large programs relative to the physician population will invariably attract less qualified physicians and probably more mills. Special programs may be required to assure access to an adequately trained, reputable physician (e.g., bonuses for participating, tuition scholarships for locating in disadvantaged areas).

Efforts to improve the maldistribution of physicians generally should improve Medicaid access. Over-doctored areas push unqualified physicians into the market while under-doctored areas make access to any physician difficult. As long as Medicaid pays lower fees, and prejudice among physicians against treating public patients persists, access problems will remain, but a better distribution of physicians, through competition, can help. Thus, programs like the National Health Service Corps seem well motivated.

The impact of the Health Professions Education Assistance Act in restricting FMG immigration is less clear. On the one hand, FMGs participate more often in the Medicaid program, which improves physician access. The care delivered, on the other hand, may not always be satisfactory. Will the vacuum created by the disappearance of FMGs be filled by more qualified U.S. physicians? Given the opportunities to make large incomes elsewhere, the prospects are not encouraging, not unless major efforts are made to reallocate U.S. physicians and make the public programs more attractive financially and administratively.

It is interesting to speculate on the effects of National Health Insurance on the Medicaid population. To the extent fee differentials across insurers are reduced (or possibly eliminated), serving the poor would become relatively more attractive, but so would serving the near poor who currently are least insured for physicians' services. Without significant increases in physician supply, or reallocations across patient classes, it is possible that the very poor now served by Medicaid would be worse off as the near poor compete with them in the waiting room. Offsetting this, of course, would be expanded coverage to the truly poor in states with meager Medicaid programs. Universal insurance may also have the effect of extending Medicaid mills to other than the poor as all financial constraint to individual utilization is removed.

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